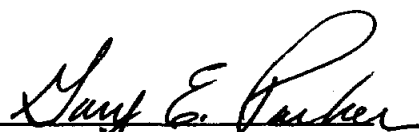


PHASE I AND IA INVESTIGATION REPORT
SOUTHEAST CORNER OPERABLE UNIT
WINNEBAGO RECLAMATION
ROCKFORD, ILLINOIS

REVISED JANUARY 1993



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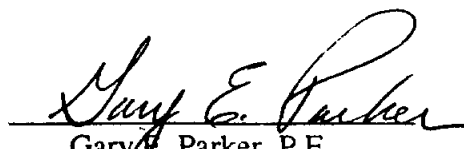
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EXECUTIVE SUMMARY

This report documents the Phase I and IA work conducted at the Winnebago Reclamation Landfill (WRL Site), also known as Pagel's Pit, as required under the Work Plan approved by the U.S. Environmental Protection Agency for the Southeast Corner Operable Unit remedial investigation and feasibility study (RI/FS). The work was undertaken to further define the upgradient background groundwater quality and to determine if a continuous volatile organic compound (VOC) plume exists between the Acme Solvent Site and WRL Site. Phase I work involved the construction of borings into the shallow bedrock at a location upgradient of the WRL Site but downgradient of the Acme Solvent Site (oriented along a north-south line between the STI-5 series wells on the north and wells STI-7I and B9 on the south). As the boring into the bedrock was advanced, successive intervals below the water table were isolated with a packer system, purged, and a sample collected for analysis using the field gas chromatograph (GC). Based upon the analytical results, decisions to install a monitoring well and, if installed, the interval over which the well would be screened were made.

The first boring (G120A), located approximately 160 ft south of well STI-5I, was drilled to a total depth of about 97 ft below ground surface. The second boring (G120B), located about 45 ft north of well B9, was drilled to a total depth of about 162 ft below ground surface. No VOCs were detected from any interval sampled in boring G120A. Boring G120A was plugged and abandoned. Through the total depth of boring G120B, several fractured zones were intercepted. Sampling and analysis of successive intervals of boring G120B indicated the presence of two separate intervals of contamination, each with distinct contaminant characteristics - the shallow fracture zone was dominated by toluene, ethylbenzene, and xylenes, and the deeper fracture zones were dominated by chlorinated ethenes and ethanes.

The measured presence of toluene in the shallow fracture zone at boring G120B corresponds to the detection of elevated concentrations of this compounds at well B4, which is located hydraulically upgradient of G120B and immediately downgradient of an area of known solvent disposal at the Acme Solvent Site. The presence of chlorinated ethenes and ethanes in the lower fracture zones corresponds to the type of compounds historically detected at well B4 and the

compounds that were historically and are currently detected at well MW202 - a deep well in close proximity to well B4. Historically contamination at well B4 was characterized by high concentrations of chlorinated ethenes and ethanes. B4 now exhibits high concentrations of ethylbenzene, toluene, and xylene.

The data collected during Phase I and IA activities clearly indicates:

- The identified fracture zones serve as preferential pathways for contaminant migration
- There is a clear distinction at boring G120B between the contaminants detected in the upper fracture zone (by Phase I field GC analyses) relative to contaminants detected in the deeper fracture zones
- There has been a change in the nature of contamination detected at B4, and a new plume characterized by ethylbenzene, toluene, and xylene is now moving toward the WRL Site
- Elevated concentrations of VOCs were also detected upgradient of the WRL Site at deep well MW202
- VOC contaminated groundwater exists between the upgradient Acme Solvent Site and the downgradient WRL Site

Warzyn believes that the information gained from this investigation and provided in this report documents both the contaminant migration pathway upgradient of the WRL Site and the presence of VOC contaminated groundwater migrating from the Acme Solvent Site to the southeast corner of the WRL. A conceptual model of contaminant migration in the bedrock fracture zones is presented in Figure 7. This information also suggests that these fracture dominated pathways have historically transported and are currently transporting contaminants detected at and downgradient of the WRL Site.

INTRODUCTION

This report describes the results of Phase I and IA field investigation activities conducted at the Winnebago Reclamation (Pagel Pit) Landfill Site (WRL Site or Site) for the Southeast (SE) Corner Operable Unit RI/FS. Phase I activities were described in the SE Corner Operable Unit Work Plan (Warzyn Inc., November 1991) and Quality Assurance Project Plan (QAPP) (Warzyn Inc., January 1992).

1.1 PURPOSE

The objectives of Phase I and IA field activities as stated in the Work Plan were "...to further define the upgradient background groundwater quality and to determine if a continuous volatile organic compound (VOC) plume exists between the Acme Solvent and WRL Site" (Warzyn, Work Plan, November 1991). One aspect of this work focused on determining the existence and location of a high permeability fracture zone(s) between the Sites. Such a fracture zone could serve as a preferential migration pathway for contaminants detected downgradient of the Acme Solvent Site. If present, such a fracture zone may not have been identified in earlier studies due to the highly localized nature of the fractures.

1.2 APPROACH

Previous investigation reports, including the Remedial Investigation, Winnebago Reclamation Landfill report (Warzyn, October 1990), Interim Groundwater Quality Evaluation, Winnebago Reclamation Landfill report (Warzyn, October 1989), and Data Analysis and Summary Report for Deep Groundwater Assessment (E.C. Jordan, 1986), indicate the presence of multiple fracture zones in the dolomite bedrock underlying the area.

Based on data collected during the RI, the Remedial Investigation Report identified a possible narrow fracture zone near elevation 690 ft to 710 ft MSL which could act as a preferential zone of groundwater and contaminant transport between the two sites. The report noted that the existence and location of this fracture zone was supported by groundwater head data which suggested that groundwater converged toward the fracture zone at the upgradient end of the fracture zone and diverged away from the downgradient end of the fracture zone. Through a fracture zone in this location, contaminants from the Acme Solvent Site could migrate within a narrow zone to the WRL Site.

The approach in the current investigation was to drill and sample borings located between the two sites in the area where previous investigations suggested a narrow fracture zone existed. The area selected was bounded on the north by the STI-5 well nest and on the south by the STI-7 and B9 wells. Based on sampling of the borings, a permanent monitoring well was to be installed in the fracture zone which appeared most likely to be a preferential pathway for contaminant migration between the two sites.

1.3 SCOPE

Phase I field investigation included the following tasks:

- Drilling of up to three borings (two borings were actually drilled) in the area between the WRL Site and the Acme Solvent Site
- Collecting groundwater samples from discrete depth intervals in the borings using a single packer and double packer method
- Analyzing the groundwater samples for 17 target VOCs using an on-site gas chromatograph (GC)
- Installing a groundwater monitoring well (G120B) in the most contaminated fracture zone identified by the field GC analysis of groundwater samples
- Collecting groundwater samples from select monitoring wells between the two sites and analyzing for VOCs using the on-site GC
- Collecting a groundwater sample from the new monitoring well G120B following development and analyzing for VOCs

- Measuring water levels (a planned Phase IA activity) at 72 monitoring wells (Table 1 of the Work Plan).

Phase IA field investigation included the following tasks:

- Sampling a total of 13 monitoring wells and one private water supply well
- Analyzing the samples for VOCs and selected inorganics and field parameters

PHASE I AND IA INVESTIGATION ACTIVITIES

This section describes data collection activities conducted during Phase I and IA.

2.1 PHASE I BOREHOLE DRILLING AND GROUNDWATER SAMPLING

During the Phase I investigation, two borings (G120A and G120B) were drilled in the area between the Acme Solvent Site and the WRL Site (see Figure 1). Groundwater samples were collected and analyzed while drilling to provide a vertical profile of VOC contamination at the respective boring locations.

2.1.1 Drilling

Both borings were drilled and sampled using the procedures discussed below.

The unconsolidated deposits were not sampled and were cased off with temporary steel casing. In each boring, the dolomite was continuously cored in the saturated zone using an HQ wireline core barrel to obtain representative rock samples. An air rotary drill rig was used. The rock samples were inspected by a Warzyn geologist to determine fracture density.

Boring G120A, located approximately 160 ft south of the STI-5 well nest, was drilled and sampled during the period November 5-9, 1991. Temporary six inch diameter steel casing was installed through the unconsolidated deposits to a depth of 14.5 ft below the surface. Four inch diameter temporary steel casing was telescoped through the six inch diameter casing to a depth of 35.5 ft. Coring was initiated at 21 ft below ground, and continued to a depth of 86 ft. The water table was encountered at approximately 38 ft below surface. During drilling Boring G120A was sampled at four intervals (see Table 2).

No VOCs were detected at any interval sampled from Boring G120A. Therefore, the boring was abandoned with bentonite and cement (see boring log for details).

A second boring (G120B), located about 45 ft north of well B9, was drilled and sampled during the period November 18-22, 1991. Temporary steel casing was installed through the unconsolidated material to a depth of 19.5 ft below the surface. Coring was initiated at 43 ft and continued to 165.9 ft below the surface. The water table was encountered at approximately 35 ft. Samples were collected from 12 intervals and analyzed for VOCs (see Table 3). VOCs were detected at multiple intervals and a groundwater monitoring well (B120B) was installed (see Section 2.2).

2.1.2 Groundwater Sampling

Both single and double packer systems were utilized to isolate specific intervals of the borehole from which groundwater samples were collected. The packer system consisted of either one or two inflatable packers attached to steel pipe. Water enters an "intake" in the steel pipe from the aquifer zone isolated by the packer(s). A Keck 1.5-inch diameter submersible pump was lowered down the steel pipe attached to the packer system to a point just above the upper packer.

A single packer was used at the bottom interval of the boring. A double packer system was used to isolate other (approximately 12-ft) intervals. The packer systems were tested by insertion into the temporary steel wall casing and inflating them. If the packers inflated properly and seated firmly against the casing (they did in each case), the packers were deflated and the system was lowered to the appropriate sampling depth. The packer system was reinflated to isolate a 12-foot long interval of the borehole. Two to three borehole volumes of water were removed from the isolated zone prior to sampling, if possible (amount removed depended on the rate that the borehole produced water).

A groundwater sample was collected in 40-ml. VOC vials directly from the discharge line of the submersible pump. A low discharge rate was used to minimize the potential for volatilization of contaminants. The sample was kept cold and transported directly to the on-site field GC laboratory for analysis. Samples were analyzed within 24 hours of sample collection.

The submersible pump was decontaminated between sample intervals by pumping a soap solution followed by deionized water through the pump and associated tubing. The packer system was decontaminated by steam cleaning between sample intervals.

The samples were analyzed on-site using a field gas chromatograph (GC) system (See Appendix B of the Work Plan) to determine the presence and concentration of target VOCs in the groundwater (see Table 4 for list of target VOCs).

2.2 PHASE I WELL INSTALLATION

Based upon the results of the on-Site GC analysis of groundwater samples for VOCs, a monitoring well was installed in boring G120B in the zone which had the highest VOC concentration (see Section 3). The G120B borehole was filled with bentonite from a depth of 165.9 to 148 ft below ground surface and this material was allowed to set-up before the well was installed. The base of the well was placed at a depth of 147 ft. The screened interval is 136.9 to 147 ft below ground.

The well was constructed of a 10.1 ft long stainless steel well screen attached to stainless steel riser pipe. The boring was backfilled with No. 30 flint sand to approximately two feet above the top of the well screen. Fine silica sand was placed above the sandpack to prevent migration of the bentonite seal into the sandpack. The remainder of the borehole annulus was backfilled as follows:

- Bentonite slurry (128.2 up to 26 ft)
- Bentonite chips (26 to 10 ft)
- Bentonite/cement slurry (10 ft to ground surface)

A protective locking casing was installed at ground surface. Granular bentonite was placed around the protective casing. Construction details are presented in Appendix A.

2.3 PHASE I WELL DEVELOPMENT

Well G120B was developed on December 17, 1992. Approximately 185 gallons of water were removed using a Keck submersible pump. Immediately after well development a sample was collected for laboratory analysis (Method 8010/8020; SW 846). Results are presented in Appendix B. The sample was collected from the Keck pump discharge.

2.4 PHASE I GROUNDWATER MONITORING WELL SAMPLING

Seven groundwater monitoring wells (B4, B9, G109, G109A, G113, G113A, and STI-5I) were sampled on November 15, 1991 and samples were analyzed for VOCs using the on-site field GC. The sampling was conducted so that VOC concentrations in nearby monitoring wells, including well B4 located hydraulically upgradient of WRL Site and historically exhibiting the highest concentration of VOCs, could be compared to the results of the groundwater sampling while drilling at boring G120B.

The procedure for groundwater sampling is described below. A groundwater level measurement was taken using a decontaminated electric water level indicator. Three to five well volumes of water were removed from the well using a clean bailer or submersible pump. The pump was decontaminated between wells by pumping a soap solution followed by deionized water through the pump and tubing. A sample was then collected using a stainless steel bailer attached to stainless steel cable. Samples were transferred from the bailer directly to the appropriate sample containers. Samples were analyzed for target VOCs using the on-site field GC method as soon as possible after sample collection. Samples were kept on ice in coolers until analyzed.

2.5 PHASE I WATER LEVEL MEASUREMENTS

Groundwater levels were measured at site monitoring wells during the period January 21 through 23, 1992. Measurements were taken using an electric water level indicator, decontaminated before taking the measurement at each monitoring well.

2.6 PHASE IA GROUNDWATER SAMPLING

Phase IA investigation consists of sampling the following thirteen monitoring wells, and one private well:

B4	G110	G113A	Private Well H
MW202	G111	G114	G120B
G109	G112	B13	
G109A	G113	P6	

Samples were analyzed for the following analytical parameters:

- Target Compound List (TCL) volatile organic compounds (VOCs) by low concentration SOW
- Alkalinity
- Chloride
- Sulfate
- Arsenic
- Barium
- Cadmium
- Calcium
- Potassium
- Magnesium
- Sodium

In addition, specific conductance, pH, and temperature were measured in the field.

2.6.1 Groundwater Sampling Methods

The following procedures were followed during groundwater sampling. A groundwater level measurement was taken using a decontaminated electric water level indicator. Three to five well volumes of water were removed from the well prior to sampling using a clean bailer or submersible pump. When a pump was used, the pump was decontaminated between wells by pumping a soap solution followed by deionized water through the pump and tubing. The sample was collected using a stainless steel bailer attached to stainless steel cable. Samples were transferred from the bailer directly to the appropriate sample containers. Samples were filtered (with the exception of samples for VOC analysis) and preserved in the field, and field parameters were analyzed as soon as possible after sample collection. Samples were kept on ice in coolers and shipped to the analytical laboratory at the end of each day. Well locations are shown on Figure 1.

RESULTS OF INVESTIGATION

3.1 GEOLOGY

The bedrock at the Site is composed of dolomite, with chert layers or nodules commonly noted throughout the dolomite. The dolomite is generally fractured throughout the interval sampled. These fractures are dominantly horizontal bedding planes, frequently cross-cut by high angle or vertical fractures. Vugs (void spaces) are consistently found throughout the dolomite, with their frequency ranging from slightly vuggy to very vuggy. No cavernous zones were noted.

One measure commonly used by geologists to quantify the extent of rock fracturing is the rock quality designator (RQD). RQD is the ratio of the length of recovered pieces of rock core greater than 4 inches long to the total length of recovered rock core, reported as a percentage. The RQD is a quantitative measure of the degree of fracturing in the sample. A high RQD indicates more competent rock (less fractured), while a low RQD indicates more fractured rock.

In the present investigation the RQD of dolomite core samples ranged from 0% to 70% for boring G120A and from 10% to 98% for boring G120B. The boring logs for borings G120A and G120B, as well as photographs of the rock core samples, are presented in Appendix A. RQD values are shown on the left side of the log.

Bedrock is present at approximately 15 feet below ground surface near borings G120A and G120B. In each boring, highly fractured (relatively low RQD) intervals were found between intervals of rock containing few fractures (high RQD), indicating rock competence did not generally improve with depth. The highly fractured zones found in boring G120B were as follows:

- Elevation 711.5 to 712.5 ft MSL (depth 43 to 45.8 ft below ground surface)

- Elevation 689.7 to 699.7 ft MSL (depth 55.8 to 65.8 ft below ground surface)
- Elevation 679.7 to 682.7 ft MSL (depth 72.8 to 75.8 ft below ground surface)
- Elevation 659.7 to 669.7 ft MSL (depth 85.8 to 95.8 ft below ground surface)
- Elevation 613.9 to 620.7 ft MSL (depth 135.3 to 141.6 ft below ground surface).

Fracture zones found in boring G120A were as follows:

- Approximate elevation 697.3 to 714.4 ft MSL (depth 45.2 to 59.9 ft below ground surface)
- Approximate elevation 670.9 to 680.9 ft MSL (depth 76.1 ft to terminus of boring at 86.1 ft below ground surface)

G120A was not surveyed; therefore, elevations are approximate. Fracture zones are shown on the potentiometric cross section, Figure 3 (based on data from borings G120B, MW201A, MW202, and G109/G109A). The cross section location is shown on Figure 2. The presence of highly fractured zones below elevation 613 ft MSL was not evaluated by this investigation.

3.2 HYDROGEOLOGY

A detailed discussion of site hydrogeology is presented in the Interim Groundwater Quality Evaluation report (Warzyn, 1989) and in the Remedial Investigation (RI) Report (Warzyn, 1991). The aspects of local groundwater flow which are most relevant to the present investigation are summarized in this section.

Horizontal groundwater flow is generally from the bedrock upland (recharge area) in the vicinity of the Acme Solvent Site to the west, beneath the WRL Site, toward the Killbuck Creek Valley (potential discharge area). The water table is present in the dolomite bedrock east of well nest B13/P6 and in the unconsolidated deposits to the west of well nest B13/P6. Groundwater flow direction is illustrated on Figure 4. Groundwater elevations are presented on Table 1.

Groundwater flow direction in the Southeast Corner is toward the west or southwest. Monitoring wells in the southeast corner (G113/G113A) and in the area between Acme and the WRL Site indicate small downward groundwater gradients. Groundwater flow beneath the Southeast Corner is primarily horizontal (see Figure 3).

Groundwater elevation data collected during Phase I confirms that the bedrock upland area beneath the Acme Solvent Site is a recharge area. Figure 3, a potentiometric cross section, illustrates the downward groundwater flow component in this area.

Based on the results of Phase I, groundwater flows from the upland bedrock recharge area through a high permeability fracture zone which exists between the Acme Solvent Site and the southeast corner of the WRL Site. As suggested in the RI Report, convergent groundwater flow (flow is toward the fracture zone from above and below) occurs in the vicinity of well nest B6S/B6D/MW105 (see Figure 3). To the west of this well nest, the groundwater gradient is low between this well nest and well nest G109/G109A with little head loss, a result of the high permeability fracture zone. West of well nest G109/G109A, hydraulic gradients steepen appreciably downgradient of well nest G109/G109A as groundwater diverges away from the fracture zone.

In the Phase I investigation, the results of rock coring at boring G120B and G120A confirm the existence of the fracture zone (see Section 3.1). The existence of this zone was further confirmed by the results of groundwater sampling conducted while drilling (see Section 4).

Both wells G113A and G109 are downgradient of boring G120B and, based upon potentiometric measurements, also appear to be downgradient of the shallow fracture zone intercepted in boring G120B (see Section 3.1 and Figure 3).

3.3 RESULTS OF GROUNDWATER SAMPLING

GC analysis was used during Phase I field activities to provide screening characterization of groundwater samples collected from discrete intervals of borings G120A and G120B, from a sample collected from each of seven existing monitoring wells, and from samples collected from the new well completed at boring G120B.

3.3.1 Phase I Groundwater Sampling While Drilling

Groundwater samples were collected while drilling using a single or double packer system (isolating a discrete interval) at borings G120A and G120B. Samples were analyzed for target VOCs using a field GC. VOCs were not detected in boring G120A. Toluene, 1,1,1-trichloroethane, 1,1-dichloroethane, tetrachloroethene (PCE), trichloroethene (TCE), and 1,2-dichloroethene (DCE) were detected in samples collected from boring G120B. The intervals sampled during drilling from boring G120A are presented in Table 2. The results of sampling while drilling boring G120B are presented in Table 3. The target VOC list and limits are presented on Table 4.

The highest total target VOC concentrations measured in boring G120B (total target VOCs: 101.6 ug/L) were found in the interval from 604.9 to 617.6 ft MSL (depth 137.9 to 150.6 ft). VOCs were detected above and below this interval at lower concentrations.

3.3.2 Phase I Groundwater Sampling of Monitoring Wells

Groundwater monitoring wells B4, B9, G109, G109A, G113, G113A, and STI-5I were sampled during the period the drilling occurred (see Section 2.4 for procedures). Samples were analyzed using the on-site field GC. Results are presented on Table 5. VOCs were detected in wells B4, G109, and G113A. The highest target VOC concentration (total target VOCs: 1136.8 ug/L) was detected in well B4, located immediately downgradient of a known disposal area on the Acme Solvent Site.

A groundwater sample was collected from well G120B after well development was completed. This sample was also analyzed using the field GC. Results are presented in Appendix B. The total VOC concentration found in the sample was 179.6 ug/L. Cis-1,2-dichloroethene was the VOC with the highest individual concentration (100 ug/L).

3.3.3 Phase IA Groundwater Sampling of Groundwater Monitoring Wells

Groundwater monitoring wells B4, B13, P6, MW202, G109, G109A, G110, G111, G112, G113, G113A, G114, G120B, and a private well located at 8554 Lindenwood Road were sampled on January 16 and 17, 1992. Results are presented in Appendix C and are summarized on Table 7. VOCs were detected in each of the wells except well G112. The highest concentrations of VOCs were detected in monitoring wells B4 and MW202, located immediately downgradient of a known disposal area on the Acme Solvent Site. Low levels of individual VOCs (3 ug/L or less) were detected in wells G109, G109A, G113, G114, and Private Well H.

3.4 NATURE AND EXTENT, AND POTENTIAL SOURCE OF GROUNDWATER CONTAMINATION

The nature (chemical characteristics) and extent (location and distribution) of groundwater contaminants detected during Phase I and IA sampling activities are defined by the samples collected and analyzed during the construction of boring G120B and from select monitoring wells. The identification of the potential source(s) of groundwater contamination in the study area is based upon an examination of potential migration pathways and like chemical characteristics. The nature and extent and the potential source of groundwater contamination based upon Phase I and IA findings are discussed below.

3.4.1 Contaminant Profile at Boring G120B

Analysis of groundwater samples collected during Phase I while drilling boring G120B indicated contaminants were present in two distinct intervals - the upper fracture zone and the deeper fracture zones (Section 3.1) - at this location. In addition, each interval had a different group of contaminants - the upper fracture zone dominated by toluene while the middle and lower fracture zones were dominated by cis- and trans- 1,2-dichloroethene (1,2-DCE) (Table 3). A profile of 1,2-DCE and toluene concentrations detected at differing intervals in boring G120B is presented in Figure 5. No target VOCs were detected in the competent bedrock interval (about 12 ft) between the upper (shallowest) and the middle fracture zone at this boring.

Toluene was detected at boring G120B in the zone from 34 to 78 ft below ground surface (elevation 667.2 to 721.5 ft MSL). This zone corresponds to the shallowest fracture zone described in Sections 3.1 and 3.2. The highest toluene concentration detected at boring G120B was approximately 12 times less than that detected at upgradient well B4 (sampled during Phase I concurrent with drilling of boring G120B). If it was assumed that a similar reduction would occur in the chlorinated ethene concentration between well B4 and boring G120B, it would be expected that the 1,2-DCE (cis and trans) concentration would be reduced from the measured 17.3 ug/L at B4 to below the reported 5 ug/L detection limit at boring G120B. In fact, no chlorinated ethene compounds were detected at this fracture zone in boring G120B.

At greater depth in boring G120B (90 to 162 ft below ground surface or elevation 593.5 to 665.5 ft MSL), chlorinated ethenes and ethanes were detected at concentrations ranging from 5.97 ug/L to 101.7 ug/L (total measured chlorinated ethenes plus ethanes). These elevations correspond to the two deeper fracture zones described in Section 3.1. The highest concentrations of chlorinated ethenes plus ethanes were detected at 138 to 150 ft below ground surface, the elevation of

the deepest fracture zone described in Section 3.1. At these depths, however, toluene was not detected.

Based upon the detection of the chlorinated ethenes and ethanes at the deeper fracture zones in boring G120B, a deep well (G120B) was installed with a 10 ft long well screen and sand pack from elevation 608.5 to 624.6 ft MSL, extending across the deeper fracture zone.

3.4.2 Contaminant Distribution Based Upon Phase I Sampling and Analysis

Concurrent with the drilling and sampling of boring G120B, select groundwater monitoring wells (B4, B9, G109, G109A, G113, G113A, and STI-5I) were sampled and analyzed to establish qualitative, based upon field GC analysis, benchmark characteristics of the groundwater both up- and downgradient of the boring. Analytical results from those wells (Table 5) show that of the wells sampled, the highest concentration of total target VOCs (1136.8 ug/L), dominated by toluene and total xylenes, was found at well B4. Of the other wells sampled during Phase I, target VOCs were detected only in wells G113A and G109A (the deeper wells in the respective well nests) at 127.1 ug/L and 7.62 ug/L, respectively. The VOCs detected in both wells, G113A and G109A, were dominated by 1,2-dichloroethene (cis and trans); no toluene or xylenes were detected. Concentrations of total target VOCs detected in boring G120B were highly dependent upon depth and ranged from 7.45 ug/L to 101.7 ug/L. The dominant VOC constituent detected in boring G120B, like the total VOC concentration, was dependent upon the depth of the sample, changing from toluene in the upper fracture zone to 1,2-DCE (cis and trans) in the middle and lower fracture zones.

The measured concentrations of target VOCs analyzed during Phase I are summarized in Table 5. As indicated above and shown in the table, measured concentrations of total target VOCs (target VOCs listed in Table 4) generally decrease with distance from well B4 downgradient to wells G113A and G109A. The same declining trend in measured concentrations is observed for benzene, ethylbenzene, toluene, and xylene (BETX) and total ethanes. For other parameters, such as 1,2-DCE (cis and trans) the trend is mixed, with measured concentrations increasing from well B4 to well G120B and either decreasing or remaining about constant between well G120B and well G113A or significantly decreasing from well G120B to well G109A. This mixed trend is attributable to a change in the nature of the contaminants detected at B4 (discussed below in Section 3.4.4) and the completion interval of the monitoring wells relative to the fracture zones discussed in Section 3.1.

3.4.3 Contaminant Distribution Based Upon Phase IA Sampling and Analysis

Following installation and development of well G120B, samples were collected from 13 groundwater monitoring wells (B4, B13, P6, MW202, G109, G109A, G110, G111, G112, G113, G113A, G114, and G120B) and one private well (Private Well H) and analyzed in the laboratory for TCL VOCs and indicator parameters. The analytical results for TCL VOCs are presented in Table 7. Analytical results for indicator parameters are presented in Appendix C. The Phase IA findings confirm the Phase I field GC measurements:

- Well B4 has high concentrations of toluene and xylenes (a very high concentration of 4-methyl-2-pentanone was also detected) relative to cis-1,2-DCE
- Deep well G120B has elevated concentrations of cis-1,2-DCE while toluene and xylene were below detection limits
- Deep well MW202 has high concentrations of cis-1,2 DCE and vinyl chloride and elevated concentrations of 1,1-DCA while toluene and xylene were below detection limits
- Low concentrations of chlorinated ethenes, one very low level detect of 1,1-dichloroethane, and no detects of toluene and xylene were measured at well G109A
- Well G110 has an elevated chlorinated ethene/ethane concentration and an elevated chloride concentration. Well G114 has essentially no chlorinated ethene/ethane concentration and an elevated chloride concentration. Wells B13 and P6 have average chloride concentrations, but both have elevated chlorinated ethene/ethane concentrations. Since the chloride ion is recognized as an indicator of groundwater affected by leachate downgradient from the landfill, a groundwater sample which exhibits a combination of low chloride concentration and elevated chlorinated ethene/ethane concentrations indicates the source of those chlorinated ethene/ethane concentrations is not the WRL, and further indicates that the elevated chlorinated ethene/ethane concentration in groundwater samples with elevated chlorides are partially or wholly attributable to an area upgradient of the WRL site.

The Phase IA analytical data also confirmed a trend of declining concentrations of chemicals at the depth of the deeper fracture zone from the Acme Solvent Site downgradient toward the southeast corner of the WRL Site. With the completion of well G120B at the deeper fracture zone identified in Section 3.1, the Phase IA analytical data for well G120B is compared to the analytical data for well MW202

which is completed at approximately the same depth. This comparison confirms a declining contaminant trend, based upon cis 1,2-DCE, from MW202 at 2900 ug/L to G120B at 94 ug/L to G113A and G109A at 90 ug/L and 2 ug/L, respectively.

Groundwater samples collected from three wells (B4, MW202, and G120B) on January 16 and 17, 1992 were split between Warzyn and Harding Lawson Associates (HLA) and submitted to two different laboratories for analysis. Table 8 presents HLA analytical results for wells B4, MW202, and G120B. Validated laboratory reports are presented in Appendix C. Well B4 results correlate well with those reported by Warzyn and report high 4-methyl-2-pentanone, toluene and xylenes levels, and low chlorinated ethene/ethane concentrations. MW202 set at a deeper interval has high chlorinated ethene/ethane concentrations and low toluene and xylenes levels. 4-methyl-2-pentanone was not detected at MW202 above the detection limit. These analyses document the presence of chlorinated ethenes/ethanes at depth; moving east to west from the Acme Solvent Site toward the WRL site (downgradient) through a lower fracture zone.

3.4.4 Changes in the Nature of Contaminants

The dominant presence of toluene and total xylenes in well B4, located immediately downgradient of an identified disposal area on the Acme Solvent Site, measured during Phase I and IA activities reflect a change in the nature of contaminants detected during the RI (refer to Table 6 for a comparison of target VOC results during the three sampling events and Appendix D for graphs of water quality versus time). In the June 15, 1988 RI sampling, the primary target VOC contaminants detected in well B4 were chlorinated ethenes (total ethenes: 1916 ug/L) and chlorinated ethanes (total ethanes: 541 ug/L), concentrations of benzene, ethylbenzene, toluene, and xylene were detected at 1.9 ug/L, non-detect, 1.7 ug/L, and 13.1 ug/L respectively. Phase I sampling and analysis field GC analysis suggested and Phase IA activities confirmed, respectively, that the contaminant profile at well B4 had changed and that toluene (347 and 730 ug/L), total xylenes (590 and 800 ug/L), and ethylbenzene (104 and 170 ug/L) now predominate over chlorinated ethenes (total ethenes: 28 and 41 ug/L) and chlorinated ethanes (total ethanes: 58 and 66 ug/L). The chlorinated ethenes and ethanes have apparently migrated from the source area and have been replaced with toluene, xylenes, and ethylbenzene. The reason for this source change is not known, but the shift in the contaminant profile is very important when interpreting downgradient groundwater quality results.

The types of contaminants at monitoring wells G109A and G113A have not changed, but concentrations have significantly decreased over time (see Appendix D). The concentrations of total chlorinated ethenes and total chlorinated ethanes at well G113A (103 ug/L and 24 ug/L, respectively) and at

well G109A (7.6 ug/L and non-detect respectively) are substantially lower than the respective total chlorinated ethene and total chlorinated ethane concentrations detected at well G113A (534 ug/L and 206 ug/L) and well G109A (115 ug/L and 29 ug/L) during the June 14, 1988 RI sampling.

Historical analytical data reported in the Supplemental Technical Investigation for the Acme Solvent Site indicated that concentrations of 1,2-DCE (cis and trans) ranged from 1700 ug/L in well MW202 to 2400 ug/L in Well B4 over the period June 11, 1988 to March 24, 1989 (see Appendix D). A 1,2-DCE (cis and trans) concentration of 2900 ug/L was detected at well MW202 during Phase IA sampling. Thus, there appears to be a slight trend in increasing concentration of 1,2-DCE (cis and trans) at well MW202.

The data indicates two changes have occurred in the shallow bedrock. They are:

- First, the concentration of chlorinated VOCs downgradient of the Acme Solvent Site has decreased substantially as shown by the lower chlorinated VOC concentrations in the shallow bedrock at well B4. Removal or substantial reduction of the source of these chlorinated VOCs may have caused the plume of chlorinated VOCs in the shallow bedrock groundwater to be cut off from its source and the trailing edge to move away from the source area. The lack of chlorinated VOCs in the shallow bedrock at boring G120B (as indicated by Phase I field GC analyses) and the major reduction in chlorinated VOCs at wells further downgradient (e.g., wells G109A and G113A) suggests the trailing edge of this chlorinated VOC plume is located between wells G120B and G113A. Therefore, the concentrations of chlorinated VOCs at well G113A (and other downgradient wells in this plume) will likely continue to decrease.
- Second, the concentration of toluene and xylene at well B4 at the Acme Solvent Site has substantially increased.

In addition, 4-methyl-2-pentanone, previously undetected, or detected at lower concentrations (undetected, 11 ug/L, and 360 ug/L on November 11, 1988, March 24, 1989, and May 21, 1989, respectively) was detected at a high concentration (5600 ug/l) at well B4. 4-methyl-2-pentanone (a/k/a isopropylacetone, methyl isobutyl ketone (MIBK), hexone, etc.) is a common industrial solvent. It is a member of a group of ketones mainly used as solvents in the production of plastics, artificial silk, explosives, cosmetics, perfumes, and pharmaceuticals. These solvents are also widely used for dyes, resins, gum, tars, waxes

and fats, and in the extraction of lubricating oils (Encyclopedia of Occupational Health and Safety, 1985).

It appears that this toluene/xylene contamination has migrated westward to midway between the Acme Solvent Site and WRL Site as shown by the toluene detected in boring G120B during Phase I field GC analyses. This plume has not yet reached the area of wells G109/109A and G113/113A.

Continuation of these trends could result in continued reduction of chlorinated VOCs and a potential increase in toluene and xylene in the southeast corner of WRL Site.

Adequate data are not available to evaluate changes in the nature of contaminants that may have occurred in the deeper bedrock. The available historical and current data indicate that, a significant concentration of cis-1,2-DCE is present in the deeper bedrock at MW 202.

3.4.5 Extent of Contamination

Comparison of detects for the tested intervals of boring G120B (Table 3) indicates that toluene was detected in the upper fracture zone in concentrations at 12 to 47 times lower than at well B4, while 1,2-DCE (cis and trans) was detected in the lower fracture zone at concentrations 2.5 to 3 times higher than at well B4. As noted in Section 3.4.1, there is a direct relationship between the type of contaminants detected and the depth (proximity to the identified fracture zone intervals) within boring G120B. The change in the relationship of contaminant concentrations between well B4 and detects at boring G120B are attributable to the interval sampled at G120B and the change in contaminant characteristics at well B4.

Well MW202 and well G120B are screened at deeper intervals. MW202 has a ten-foot well screen set between 114 and 124 ft below ground surface with a sand pack between 87.4 and 126 ft (elevation 665.4 to 626.8 ft MSL). G120B has a ten-foot well screen set between 137.9 and 148 ft below ground surface with a sand pack between 130.9 and 148 ft below ground surface (elevation 624.6 to 607.5 ft MSL). Well MW202 has a high level of cis-1,2-DCE at 2900 ppb while G120B at 94 ppb is roughly 30 times less than that detected at MW202. These two wells, completed at deeper fracture zone intervals, show contamination moving from the area of MW202 at the Acme Solvent Site downgradient toward G120B located upgradient of the WRL site.

3.4.6 Inorganic Chemistry Results

Concentrations of inorganic parameters were variable among the wells sampled. Chloride concentrations were approximately the same throughout the wells sampled (12 mg/L to 36 mg/L) with three notable exceptions. Groundwater from wells G110 and G114 located in the southeast corner of the WRL Site contained chloride concentrations of 487 mg/L and 126 mg/L, respectively. Groundwater collected from Acme Solvent Site wells B4 and MW202 and from wells between the WRL Site and Acme Solvent Site (G112, G109/109A, and G113/113A) contained lower levels of chloride (12 to 31 mg/L, see Figure 6) with the exception of the private well which had a chloride concentration of 191 mg/L. These results support the belief that compounds detected in WRL Site wells are not migrating eastward towards Acme Solvent Site.

We believe the elevated chloride concentration at the private well is related to the septic system. The home has a water softener which discharges to a septic system in back of (east) of the home. The well is located west of the home, downgradient of the septic system. The fact that monitoring wells located between the private well and the WRL Site do not show these elevated chloride concentrations supports this conclusion. Laboratory results are presented in Appendix C.

3.4.7 Potential Contaminant Source(s)

The source of contaminants detected in boring G120B appears to be located on the Acme Solvent Site. Toluene detected in the upper fracture zone is probably originating at the Acme Solvent Site. Chlorinated ethenes and ethanes previously present at well B4 have likely migrated through the shallow fracture zone beyond the boring G120B location. These compounds may have also migrated downward, as evidenced by the high concentrations being detected at MW202. Chlorinated ethenes and ethanes conveyed to the southeast corner of the WRL Site probably were carried through the shallow fracture system. Contamination also appears to be migrating toward the southeast corner of the WRL Site in the deeper fracture zone identified in Section 3.1, and was detected in deep monitoring well G120B. This contamination also likely originates at the Acme Solvent Site.

HISTORICAL FINDINGS

The WRL Site, (also called Pagel's Pit) an active solid waste landfill site, was officially licensed in 1972 by the State of Illinois and is presently operated by Winnebago Reclamation Services. The WRL Site is located in south central Winnebago County in north central Illinois. The Site is bounded on the west by Killbuck Creek and on the east by Lindenwood Road. An active sewage sludge drying plant is located on the Site just north of the landfill, and is operated by NRG Technologies. The Rockford Skeet Club is across Lindenwood Road to the northeast; a septic tank pumping business is located to the west, and a private hunt club to the southwest. Several private wells are located within 1/4 mile of the Site.

Wastes accepted at the WRL Site are composed primarily of municipal refuse and sewage treatment plant sludge from the Rock River Water Reclamation District City of Rockford sewage treatment plant. The landfill accepted wet sewage treatment plant sludge until January 1985. Since January 1985, only dried sludge has been placed in the landfill. A very limited amount of Illinois special non-municipal wastes were disposed of at the facility prior to December 1975 under permits issued by the IEPA. After 1990, limited quantities of non-hazardous special wastes (e.g., foundry sand, grinding dust, soils excavated during removal of underground petroleum storage tanks) have been accepted at the landfill.

East of the WRL Site is the former Acme Solvent Reclaiming (Acme) NPL Site. The Acme Solvent Site is situated on approximately 20 acres, and was used for the disposal of drummed wastes into unlined lagoons and drum stockpiling. The Acme Solvent Site operated from 1960 to 1973. The type, origin, and quantities of wastes disposed of at the Acme Solvent Site are generally undocumented, but are known to have included solvent still-bottom sludges, nonrecoverable solvents, paints, and oils.

Representatives of the IEPA, Division of Land Pollution Control first visited the Acme Solvent Site in February 1972 in response to a report filed by an area game biologist. In mid-1981, both the IEPA and the Winnebago County Health Department responded to complaints from residents in the area of Pagel's Pit-Acme Solvent Site by testing drinking water supplies. Findings indicated the presence of numerous organic compounds. Concentrations of total volatile organics detected reached as high as 517 micrograms per Liter (ug/L). At that time, it was not known whether the source of the contaminants was Acme Solvent Site, Pagel Pit or both.

Warzyn began groundwater evaluations at the WRL Site in the fall of 1984 during a supplemental investigation based on the review of the E.C. Jordan remedial investigation report. The intent of the supplemental investigation was designed to clarify the groundwater flow system and groundwater chemistry between the eastern edge of WRL Site and the western edge of Acme Solvent Site, and to distinguish impacts between the landfill and the solvent disposal facility. The investigation included the drilling of 10 borings in the area between Acme Solvent Site and WRL Site, six of which were instrumented as monitoring wells and four of which were instrumented as piezometers. Among the conclusions of this investigation were:

- Groundwater was found to flow from east to west, from Acme Solvent Site toward WRL Site
- Vertical gradients were found to be slightly downward, with localized upward gradients
- Fracture flow in the bedrock aquifer might be responsible for the discontinuity in the plume of volatile organics from Acme Solvent Site to the southeast portion of the WRL landfill

Groundwater level measurements taken by Warzyn in March, April and May of 1985 added significant observations to the supplemental investigation. The March readings were collected during a significant precipitation event and indicated a groundwater mound under the southwest edge of Acme Solvent Site associated with an intermittent creek which crosses Acme Solvent Site property. The groundwater mound appeared to be a component of recharge conditions during heavy precipitation events such as the one in March, and vertical groundwater gradients under the mound were generally downward, while at a distance from the mound vertical flow appeared to be upward. Switching of vertical gradients coupled with intense recharge events was thought to potentially account for the spotty nature of contaminants detected in the shallow groundwater (e.g., contaminants found in shallow groundwater at Acme Solvent Site were

recharged, and then flowed upward at a distance away from the groundwater recharge mound).

E.C. Jordan Co. modeled this condition as part of its feasibility study (1985) and reported, "On the basis of field observations and evaluation of existing data, Jordan has concluded that the portion of a stream bed which crosses along the southern periphery of the site contributes substantial recharge to the shallow aquifer " "Although a transient phenomenon, groundwater recharge at this location exerts a strong influence on the flow pattern in the groundwater aquifer and enhances the mounding effects and downward gradient".

"Groundwater flow is predominantly horizontal within the region of the Acme Site. During recharge events, due to infiltration of rainfall or recharge from the stream, a vertical flow component is created and shallow groundwater is forced to a deeper level."

Hickok (1985) in a discussion of vertical groundwater gradients recorded during different field efforts reports, "The results then show upward gradients at shallower depths (except in May (1984)), and downward gradients at greater depths. The Hickok report, Review of RI/FS Work on the Acme Solvents Site, was based on a Remedial Investigation (RI) and Quality Assurance Project Plan (QAPP) submitted by E.C. Jordan Co. (1984).

In an earlier report Ecology and Environment (1983) reported "For the purposes of this study, it should be sufficient to state that groundwater flow within the cracks and fractures of the dolomitic bedrock should be rapid. The sloping hydraulic gradient along with high hydraulic conductivity in the dolomitic bedrock aquifer should provide groundwater flow rates which would enable contaminants from Acme Solvents to reach private wells approximately one-fourth mile west of the site within ... limited time frame". The Ecology and Environment report was based on a subsurface investigation conducted in 1982 which included a magnetometer survey, drilling of seventeen borings, instrumentation of the seventeen borings as monitoring wells, groundwater sampling of the 17 monitoring wells and 6 private wells, and collection of two surface water samples.

The complex geology and hydrogeology which exists between the WRL Site and Acme Solvent Sites was noted in Warzyn's Interim Groundwater Quality Evaluation (1990) report. The report contained results of the initial phase of an RI at the WRL Site facility. The work scope included installation of 15 groundwater monitoring wells west of Lindenwood Road, collection of groundwater samples from the 15 new plus 26 previously existing monitoring wells, and collection of leachate, surface water, and sediment samples. In the evaluation report Warzyn

states, "Downward vertical movement of water is inferred from the potential vertical gradients; however, flow paths will be largely controlled by the permeability within the dolomite. Some water level measurements made at well nests in the bedrock during the Phase I RI indicate anomalous results, which can be attributed to preferential flow in the fractured dolomite".

In a Remedial Investigation Report (1991), Warzyn discussed the combined findings of its subsurface investigations and those of other consultants. The RI had been divided into two phases. Phase I was completed with the preparation of the Interim Groundwater Quality Evaluation (IGQE). Phase II was performed based upon the recommendations in the IGQE and approved by the U.S. EPA. Phase II consisted of two rounds of groundwater sampling, leachate sampling, surface water sampling, and permeability testing.

Warzyn concluded, "The bedrock near the WRL Site is composed of dolomiteis generally fractured throughout the interval sampled. The fractures are dominantly horizontal bedding planes, frequently cross-cut by high angle or vertical fractures."

"A zone of up to 37 ft thick of highly fractured, soft dolomite in the near surface bedrock was encountered during drilling in previous investigations at 752 ft to 715 ft MSL in boring B16A (Warzyn, 1985), at 740 ft to 715 ft MSL in boring B7 (E&E, 1983) and at 737 ft to 732 ft MSL in boring B6D (E&E, 1983). The borings where the fractured zones were encountered are located in the vicinity of the northern intermittent stream, with the RQDs ranging from too soft to core to 28%."

Mounding of groundwater under a portion of the southwest corner of the Acme Solvent Site is also discussed by Warzyn. In the bedrock upland, "west is the typical downgradient direction, but an eastward gradient was observed (i.e., a groundwater mound) on April 6, 1988". "It is thought the mounding is due to higher localized recharge rates in this area from the north unnamed intermittent stream. The presence of groundwater mounds was again noted in the upland bedrock area east of the WRL Site on February 5, 1990 and April 20, 1990".

Combining the two observations, Warzyn concluded, "The effect of a groundwater mound is a local gradient reversal (i.e., radial flow locally). The effect of the high permeability zone is high gradients and converging flow at the upgradient end of the zone, low gradients within the zone, and high gradients and diverging flow at the downgradient end on the zone". In other words, contaminants detected in shallow groundwater at the edge of the Acme Solvent Site could, during a time of groundwater mounding, be forced deeper due to the downward vertical gradient, "funneled" into fracture zones in the dolomite

bedrock, and emerge downgradient where the fracture terminates in unconsolidated materials. At that point, the contaminants would disperse into three dimensions.

The results of the Phase I and IA investigation, strongly support previous conclusions, namely that the highly fractured zones exist in the dolomite bedrock between the WRL Site and Acme Solvent Site and that these fracture zones can provide a pathway for migration of contaminants from the Acme Solvent Site toward the WRL Site.

FINDING AND CONCLUSIONS

The following findings and conclusions can be drawn from the Phase I and Phase IA investigation results:

Findings:

- Phase I and Phase IA data (boring logs, water level measurements, and water quality data) confirms the presence of a high permeability fracture zone comprised of fractures at relatively shallow depth (55.8 to 65.8 ft below ground surface), intermediate depth (85.8 to 95.8 ft below ground surface), and at depth (135.3 to 141.6 ft below ground surface) in the dolomite bedrock.
- Groundwater flows from east to west. The shallower fracture zone is a preferential flow pathway as shown by the groundwater elevations at monitoring wells located north and south of the fracture zone and wells screened above and below the fracture zone.
- Two different types of contaminants were detected at two separate depth intervals in boring G120B. Toluene was detected during Phase I field GC analysis in the shallower zone - one of the same constituents found at well B4. Deeper contamination consisted primarily of chlorinated ethenes - the constituents historically found in high concentrations at B4 and MW202 and currently detected in high concentrations at MW202 and in lower concentrations at B4.
- The nature of contaminants present immediately downgradient of the Acme Solvent Site at well B4 has changed substantially. The concentrations of chlorinated ethenes and ethanes detected during the WRL Site RI have been reduced by approximately 23 to 28 times, respectively, while the concentrations of toluene, xylenes, and ethylbenzene have increased one hundred fold.

- The levels of chlorinated ethenes in the southeast corner of the WRL Site have decreased by approximately 2 to 30 times since the WRL Site RI, similar to observations at well B4.
- Toluene has likely migrated from the Acme Solvent Site within the shallow fracture zone to the boring G120B location.

Conclusions:

- The area between the two sites is hydrogeologically complex. Groundwater contaminants travel along preferential pathways created by fracture zones.
- The highly fractured zones provide a pathway for migration of contaminants found at the Acme Solvent Site to the WRL Site (Southeast Corner) and beyond.
- Contaminants have been identified in at least two depth intervals. The shallower contaminants are now dominated by toluene, xylenes, and ethylbenzene. The contamination appears to originate in the vicinity of the Acme Solvent Site and has not reached the WRL Site. Previously, the contamination in the shallow groundwater was dominated by chlorinated ethenes and ethanes.

The deeper groundwater contamination is dominated by chlorinated ethenes and also appears to originate east or upgradient of G120B, probably in the area of the Acme Solvent Site. Its downgradient extent has not been determined. A conceptual model of contaminant migration in the bedrock fracture zones is presented in Figure 7.

- Some of the VOCs present in the southeast corner of the WRL Site probably migrated from the Acme Solvent Site, following the same pathway as contaminants detected at well G120B. Based on lower concentrations of VOCs detected in the southeast corner, the area impacted by high VOC contamination previously detected in well B-4 now appears to extend west to the area between boring G120B and G113A.

TABLE 1

**GROUNDWATER ELEVATIONS JAN. 21 - JAN. 23, 1992
WINNEBAGO RECLAMATION LANDFILL**

<u>Well Number</u>	<u>TOIC Elevation</u>	<u>Depth to Water</u>	<u>Groundwater Elevation</u>	<u>Well Number</u>	<u>TOIC Elevation</u>	<u>Depth to Water</u>	<u>Groundwater Elevation</u>
B1	772.87	43.61	729.26	G107	739.58	31.20	708.38
B2	792.40	63.23	729.17	G108	751.29	36.59	714.70
B3	745.00	5.40	739.60	G109	760.79	41.29	719.50
B4	757.66	27.58	730.08	G109A	761.03	41.69	719.34
B5	752.85	27.77	725.08	G110	748.08	33.14	714.94
B6S	754.02	29.27	724.75	G111	741.04	24.53	716.51
B6D	754.21	31.06	723.15	G111A	740.53	24.05	716.48
B7	751.85	23.79	728.06	G112	763.29	43.30	719.99
B8	750.22	29.93	720.29	G113	762.22	44.17	718.05
B9	758.58	38.07	720.51	G113A	762.89	45.17	717.72
B10	744.34	32.18	712.16	G114	758.11	39.75	718.36
B10A	743.94	*	*	G115	729.03	16.04	712.99
B11	760.74	43.60	717.14	G116	713.76	7.11	706.65
B11A	759.09	41.20	717.89	G116A	714.06	7.36	706.70
B12	760.52	41.18	719.34	G117	723.25	16.11	707.14
B13	739.46	26.09	713.37	G118A	718.21	10.8	707.41
B14	717.30	5.76	711.54	G120B	758.44	38.40	720.04
B14A	713.70	5.72	707.98	MW103	751.17	21.91	729.26
B15R	746.29	38.59	707.70	MW105	752.82	27.96	724.86
B15	744.55	35.63	708.92	MW107	749.78	31.20	718.58
B15P	743.52	36.87	706.65	MW201A	752.12	32.26	719.86
B16	762.87	40.67	722.20	MW201B	751.15	28.16	722.99
B16A	762.72	40.50	722.22	MW202	752.81	26.40	726.41
P1	727.69	20.77	706.92	E1	738.00	5.50	732.50
P3R	749.58	42.65	706.93	E1A	738.00	19.90	718.10
P4R	749.80	42.71	707.09	E2	723.57	4.84	718.73
P6	739.71	26.68	713.03	E2A	723.18	9.52	713.66
P8	748.18	22.68	725.50	E3	721.20	5.72	715.48
P9	748.67	23.09	725.58	E3A	719.80	N/A	-----
				E4	721.50	13.61	707.89
				E4A	721.50	9.54	711.96

Notes:

* = Anomalous reading, value not reported.

TOIC = Top of Inner Casing

TABLE 1
(continued)

<u>Well Number</u>	<u>TOIC Elevation</u>	<u>Depth to Water</u>	<u>Groundwater Elevation</u>
STI - 2S	748.47	26.60	721.87
STI - 2I	748.35	26.36	721.99
STI - 2D	747.89	25.69	722.20
STI - 5S	763.96	41.09	722.87
STI - 5I	762.41	41.72	720.69
STI - 5D	762.67	42.43	720.24
STI - 6S	748.40	23.14	725.26
STI - 7I	755.04	36.90	718.14

Note:
TOIC Top of Inner Casing

TABLE 2

GROUNDWATER SAMPLE INTERVALS FOR BORING G120A
WINNEBAGO RECLAMATION LANDFILL

Sample Interval	
Depth	Approximate
<u>(Feet)</u>	<u>Elevation⁽¹⁾</u>
<u>(Feet, MSL)</u>	
50 to 62	695 to 707
60 to 72	685 to 697
71 to 83	674 to 686
85 to 97	660 to 672

Note:

- (1) Boring elevation not surveyed. Elevation is estimated to be 757 feet MSL based on USGS topographic map and survey data from nearby borings and wells.

TABLE 3

**VOCS DETECTED BY FIELD GC WHILE DRILLING BORING G120B¹¹
WINNEBAGO RECLAMATION LANDFILL**

<u>Sample Interval</u>		<u>Toluene</u>	<u>PCE</u>	<u>TCE</u>	<u>1,2-DCE³</u>	<u>1,1-DCA</u>	<u>1,1,1-TCA</u>	<u>Total Target VOCs</u>
<u>Depth</u>	<u>Elevation</u>							
34 to 42	713 to 721	7.45						7.45
42 to 54	701 to 713	12.4						12.4
54 to 66	689 to 701	17.1						17.1
66 to 78	677 to 689 ²	27.8						27.8
66 to 78	677 to 689							0
78 to 90	665 to 677							0
78 to 90	665 to 677							0
90 to 102	653 to 665				11.5			11.5
97 to 109	646 to 658				5.97			5.97
107 to 119	636 to 648				34.0	6.93		40.93
107 to 119	636 to 648				38.7	7.33		46.03
119 to 131	624 to 636				20.4			20.4
119 to 131	624 to 636				23.6	4.98		28.58
130 to 142	613 to 625		6.36	10.7	44.0	9.31	8.71	79.08
138 to 150	605 to 617		9.6	15.1	54.6	10.8	11.6	101.7
150 to 162	593 to 605			5.27	25.8	7.09		38.16

Notes:

- (1) Target VOCs and detection limits are shown on Table 4. If no value is shown on this table, the compound was not detected above the detection limit. Analyses performed using field GC.
- (2) Four sample intervals (66-78, 78-90, 107-119, and 119-131) were resampled to confirm the presence of VOCs. Both sets of results are presented here.
- (3) Includes cis and trans isomers.

Concentrations in ug/L

AJS/njt/DAP
[CHI 606 99d]

TABLE 4

**DETECTION LIMITS FOR PHASE I FIELD GC ANALYSIS
WINNEBAGO RECLAMATION LANDFILL**

<u>VOC</u>	<u>Detection Limit</u>
Benzene	5.00
Toluene	5.00
Xylenes	15.00
1,1 Dichloroethane	5.00
1,2-Dichloroethane	5.00
Ethylbenzene	5.00
1,1,1,2-Tetrachloroethane	5.00
1,1,2,2-Tetrachloroethane	5.00
Tetrachloroethene	5.00
Trichloroethene	5.00
1,2-Dichloroethene ⁽¹⁾	5.00
1,1-Dichloroethene	5.00
1,1,1-Trichloroethane	5.00
1,1,2-Trichloroethane	5.00

Notes:

(1) Includes cis and trans isomers.

Concentrations in ug/L

TABLE 5

**VOCS DETECTED DURING
PHASE I GROUNDWATER SAMPLING⁽¹⁾
WINNEBAGO RECLAMATION LANDFILL**

<u>Well Number/VOC</u>	<u>B-4</u>	<u>B-9</u>	<u>STI-51</u>	<u>G113</u>	<u>G113A</u>	<u>G109</u>	<u>G109A</u>
Benzene	9.74						
Toluene	347						
Xylenes	590						
Ethylbenzene	104						
1,1 Dichloroethane	52.5				17.1		
1,2-Dichloroethane					7.20		
1,1,1,2-Tetrachloroethane							
1,1,2,2-Tetrachloroethane							
Tetrachloroethene	10.8				12.4		
Trichloroethene					36.2		
1,2-Dichloroethene ⁽²⁾	17.3				54.2	7.62	
1,1-Dichloroethene							
1,1,1-Trichloroethane	5.50						
1,1,2-Trichloroethane							
Total Target VOCs	1136.8	0.0	0.0	0.0	127.1	7.6	0.0

Notes:

- (1) Target VOCs and detection limits are shown on Table 4. If no value is shown on this table, the compound was not detected above the detection limit. Analyses performed using a field GC.
- (2) Includes cis and trans isomers.

Concentrations in ug/L

TABLE 6

**COMPARISON OF VOCS DETECTED AT
WELL B4 DURING RI vs. PHASE I AND PHASE IA
WINNEBAGO RECLAMATION LANDFILL**

<u>VOC</u>	<u>RI⁽²⁾</u>	<u>Phase I</u>	<u>Phase IA</u>
Benzene	1.90	9.74	ND
Toluene	1.70	347	730
Xylenes	13.1	590	800
Ethylbenzene	ND	104	170
1,1 Dichloroethane	170	52.5	66
1,2-Dichloroethane	13.0	ND	ND
1,1,1,2-Tetrachloroethane	4.00	ND	ND
Tetrachloroethene	810	10.8	ND
Trichloroethene	350	ND	ND
1,2-Dichloroethene ⁽¹⁾	750	17.3	41
1,1-Dichloroethene	6.00	ND	ND
1,1,1-Trichloroethane	350	5.50	ND
1,1,2-Trichloroethane	4.00	ND	ND
Total Target VOCs	2473.7	1136.8	1807
Total Chlorinated Ethanes	541.0	58.0	66
Total Chlorinated Ethenes	1916.0	28.1	41

Notes:

- (1) Includes cis and trans isomers.
- (2) RI sampling conducted on June 15, 1988. Phase I sampling conducted on November 15, 1991, using a field GC to analyze samples. Phase IA sampling conducted January 16 and 17, 1992. Phase IA analyses performed using CLP level analyses.

Concentrations in ug/L.

TABLE 7

**VOCS DETECTED DURING PHASE IA GROUNDWATER SAMPLING
WINNEBAGO RECLAMATION LANDFILL**

<u>VOC</u>	<u>B13</u>	<u>B4</u>	<u>G109</u>	<u>G109A</u>	<u>G110</u>	<u>G111</u>	<u>G112</u>	<u>G113</u>	<u>G113A</u>	<u>G114</u>	<u>G120B</u>	<u>MW202</u>	<u>P6</u>	<u>PWH</u>
Acetone					7									
Benzene					10				2	0.8				
Chlorobenzene					10				0.8	1				
Chloroethane		120			17									
Chloroform			2	0.7										
1,2-Dichlorobenzene					4					1				
1,4-Dichlorobenzene	10				31				4	13				
1,1-Dichloroethane	14	66		0.5	7	3			18	2	12	160	6	0.9
1,2-Dichloroethane					2				1					
Cis-1,2-Dichloroethene	120	41		2	2	22			87		94	2900	46	2
Trans-1,2-Dichloroethene					2				3					
1,2-Dichloropropane	6				3				5	2				
Cis-1,3-Dichloropropene														
Trans-1,3-Dichloropropene														
Ethylbenzene		170			36									
4-methyl-2-pentanone		5600												
Tetrachloroethene	17		0.9	1		10		1	17		9		44	2
Toluene		730			2									
1,1,1-Trichloroethane	3					6			0.7		12		15	
Trichloroethene	28			0.6	2	6			39		16		22	1
Xylenes		800			80									
Vinyl Chloride	15								13		6	600		

Notes:

1) Values expressed in micrograms per liter (ug/l).

TABLE 8

**VOCs DETECTED BY HARDING LAWSON ASSOCIATES (HLA)
DURING PHASE IA GROUNDWATER SAMPLING
WINNEBAGO RECLAMATION LANDFILL**

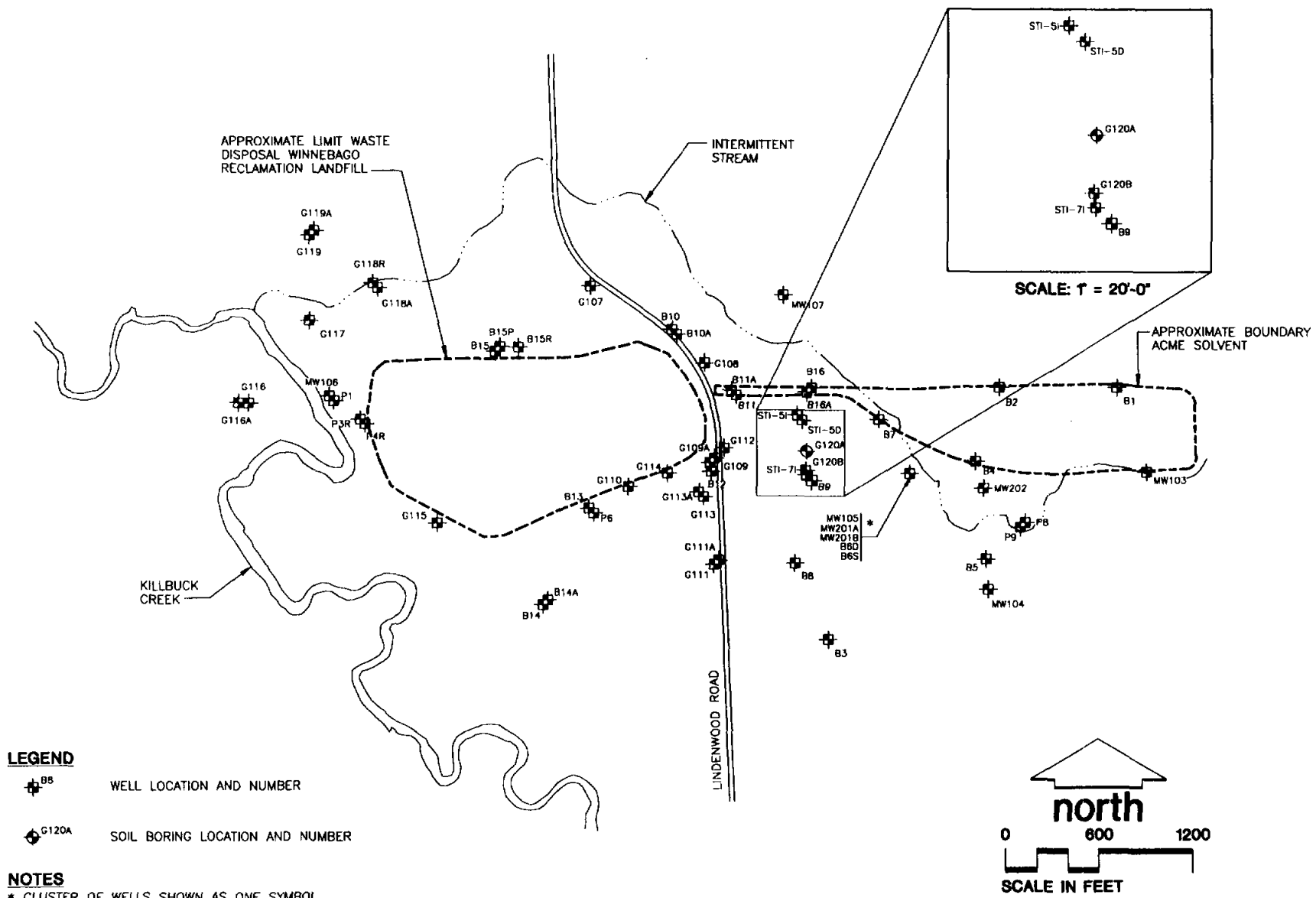
<u>VOC</u>	<u>B4</u>	<u>B4DL</u>	<u>MW202</u>	<u>MW202DL</u>	<u>G120B</u>
Acetone	370	500	22	ND	ND
Benzene	19	25	6	8	ND
Ethylbenzene	180	160	12	9	ND
Toluene	760	720	32	23	ND
Xylenes	530	460	22	15	ND
1,1-Dichloroethane	63	56	140	110	10
1,1-Dichloroethene	0.4	ND	18	11	2
1,2-Dichloroethane	ND	ND	26	ND	ND
1,2-Dichloroethene ⁽¹⁾	28	38	1,300	1,400	46
1,2-Dichloropropane	12	ND	4	ND	ND
4-Methyl-2-Pentanone	3,000	4,700	R	100	ND
1,1,1-Trichloroethane	7	ND	15	ND	13
Tetrachloroethene	ND	ND	16	15	10
Trichloroethene	ND	100	ND	59	20
Carbon Tetrachloride	ND	ND	ND	ND	2
Vinyl Chloride	4	ND	340	26	ND

Notes:

- (1) Includes cis and trans isomers
 (2) Groundwater samples collected January 16 and 17, 1992 and split between Warzyn and HLA.
 ND = Not detected at or above detection limit
 DL = Sample diluted. B4DL dilution factor was 50. MW202DL dilution factor was 10. For actual results refer to Appendix C2.
 R = Data not useable based on laboratory data validation.

QUALITY CONTROL
 Lead Professional
 8/15/11
 Technical Review
 Project Manager
 8/15/11
 Management Review
 G.E.
 8/15/11
 Other

WARZYN INC.



LEGEND

- B5 WELL LOCATION AND NUMBER
- G120A SOIL BORING LOCATION AND NUMBER

NOTES

* CLUSTER OF WELLS SHOWN AS ONE SYMBOL FOR CLARITY.

Developed By: AUS
 Drawn By: ELR
 Approved By: *Mary E. Tolan*
 Date: 8/15/12
 Reference:
 Revision:

SITE FEATURES MAP
 PHASE I AND IA INVESTIGATION REPORT
 WINNEBAGO RECLAMATION LANDFILL
 ROCKFORD, ILLINOIS

Drawing Number
 6120200 B1



FIGURE 1

101304

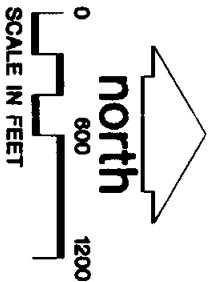


FIGURE 2

WEST A
ELEVATION

760
740
720
700
680
660
640
620
600

LEGEND



WATER TABLE SURFACE



POTENTIOMETRIC CONTOUR LINE
(FT. MEAN SEA LEVEL, MSL)

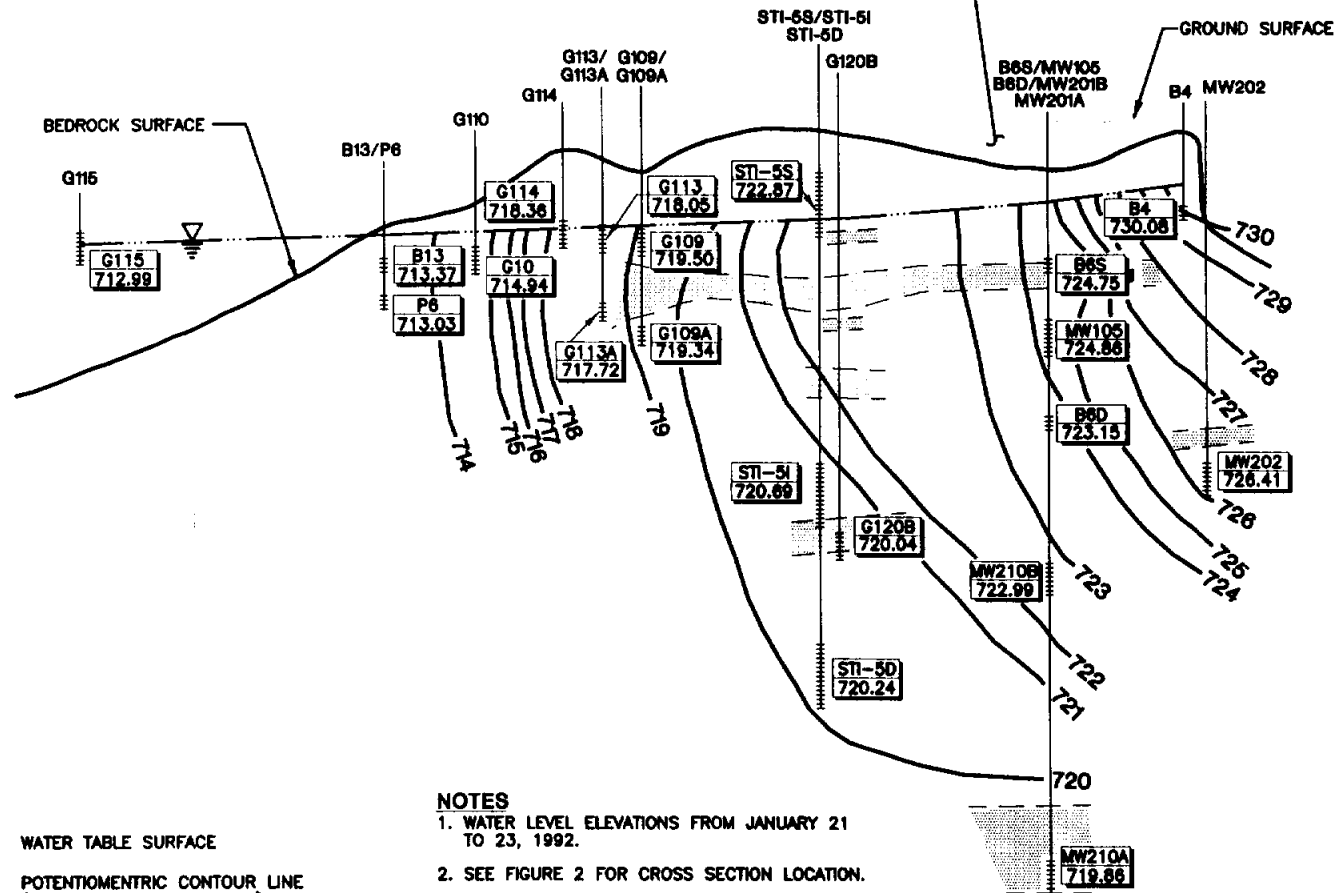


ESTIMATED BOUNDARY OF FRACTURE ZONE

G115
712.99

WELL NUMBER
GROUNDWATER ELEVATION (FT., MSL)

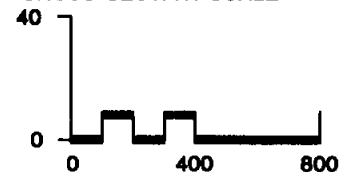
UNCONSOLIDATED DEPOSITS



NOTES

1. WATER LEVEL ELEVATIONS FROM JANUARY 21 TO 23, 1992.
2. SEE FIGURE 2 FOR CROSS SECTION LOCATION.
3. SEE TEXT FOR DISCUSSION OF FRACTURE ZONE.

CROSS SECTION SCALE



SCALE IN FEET

VERTICAL EXAGGERATION: TEN TIMES

EAST A'
ELEVATION

760
740
720
700
680
660
640
620
600
580
560
540
520
500

Developed By: AJS
Drawn By: SVB/ELR
Approved By: Gary E. Hahn
Date: 1/29/93
Reference:
Revision:

POTENTIOMETRIC CROSS SECTION A - A'
PHASE I AND IIA INVESTIGATION REPORT
WINNEBAGO RECLAMATION LANDFILL
ROCKFORD, ILLINOIS

Drawing Number
6120200 B2



FIGURE 3

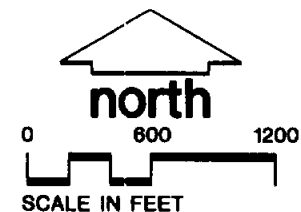
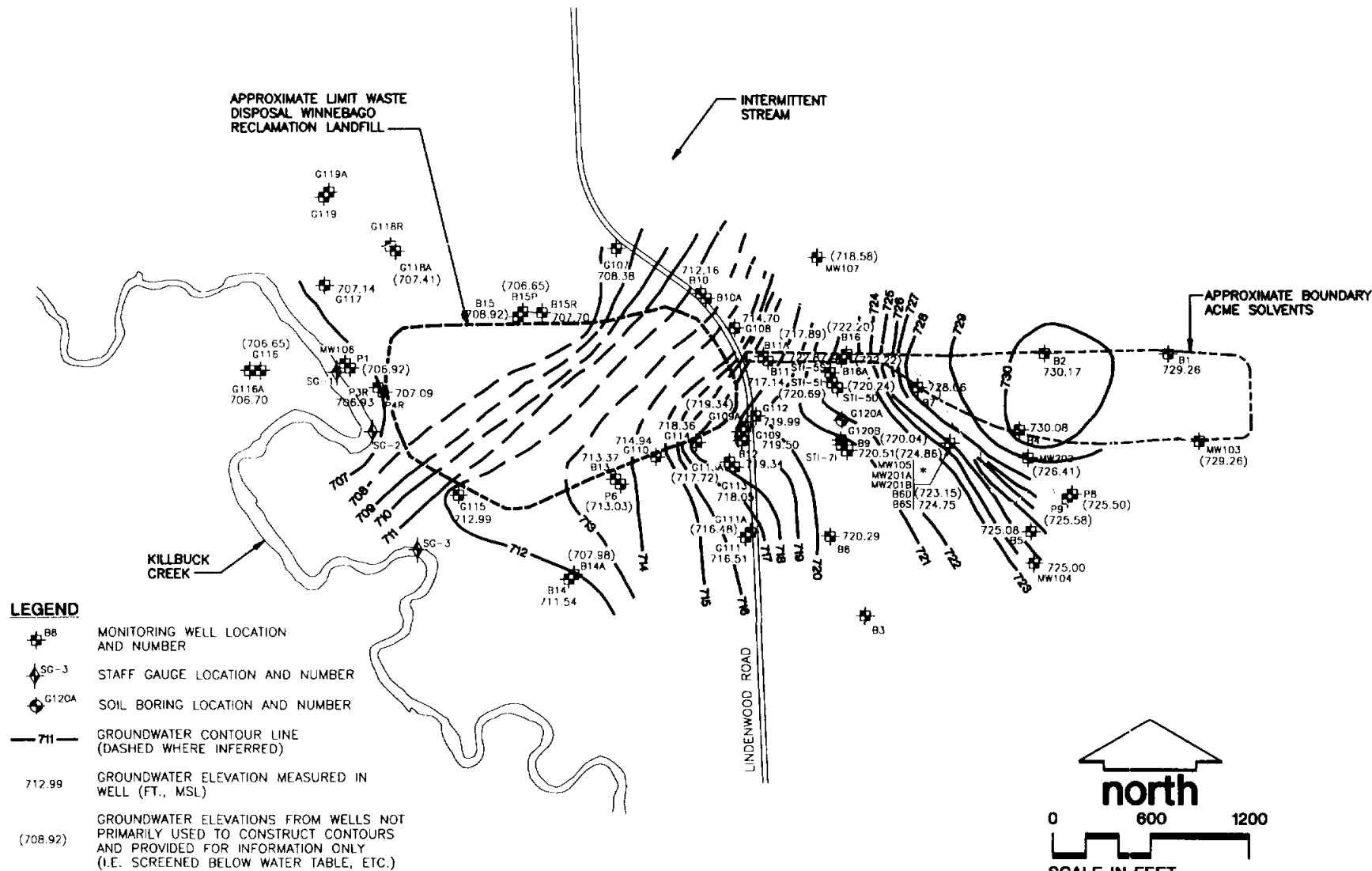



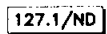




FIGURE 4

WARZYN INC.
 CONTROL Lead Professional
 Project Manager
 General Review
 Management Review

WEST A'
 ELEVATION
 760
 740
 720
 700
 680
 660
 640
 620
 600

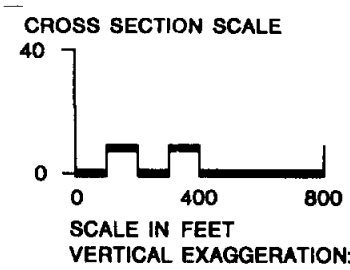
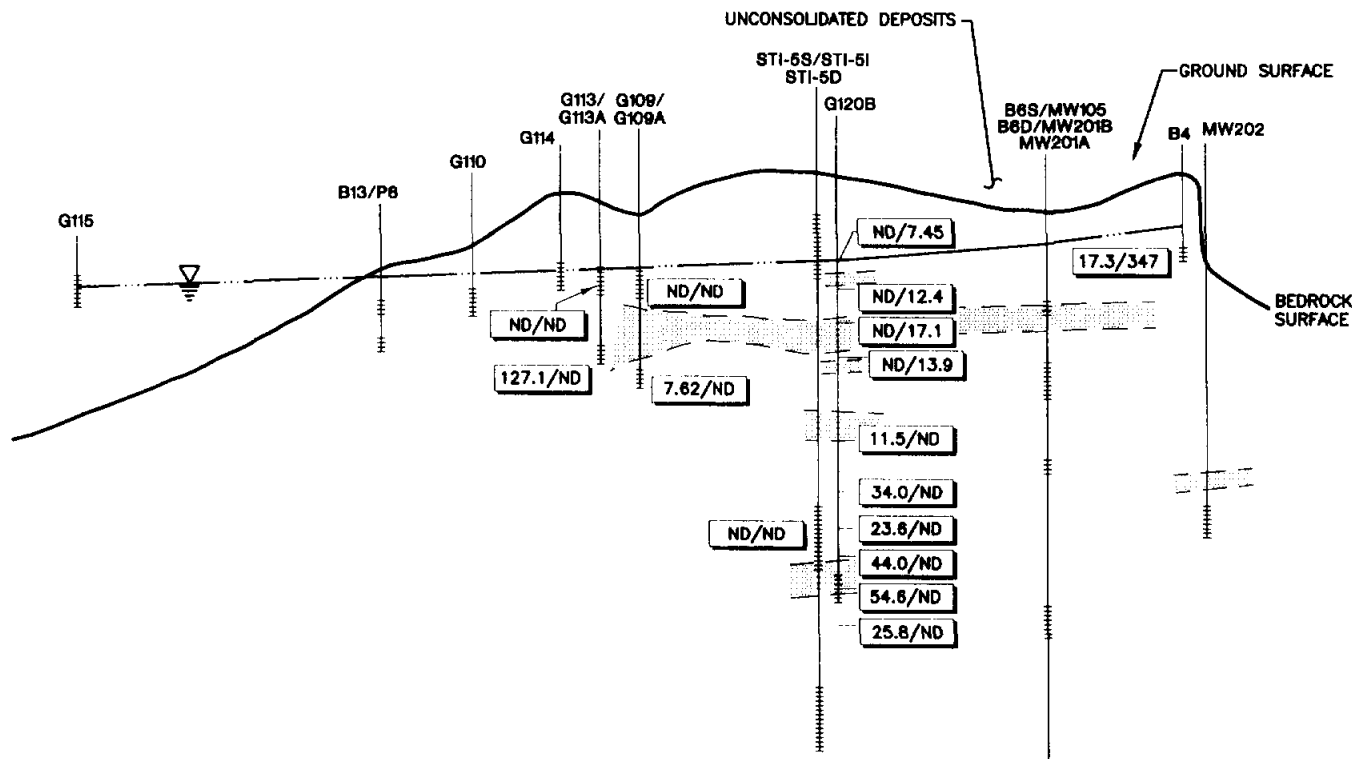
EAST A'
 ELEVATION
 760
 740
 720
 700
 680
 660
 640
 620
 600
 580
 560
 540
 520
 500

LEGEND

-  WATER TABLE SURFACE
-  1,2-DICHLOROETHENE/TOLUENE CONCENTRATION (ug/L)
-  ND NOT DETECTED
-  ESTIMATED BOUNDARY OF FRACTURE ZONE
-  G115 WELL NUMBER
-  WELL SCREEN/INTAKE INTERVAL

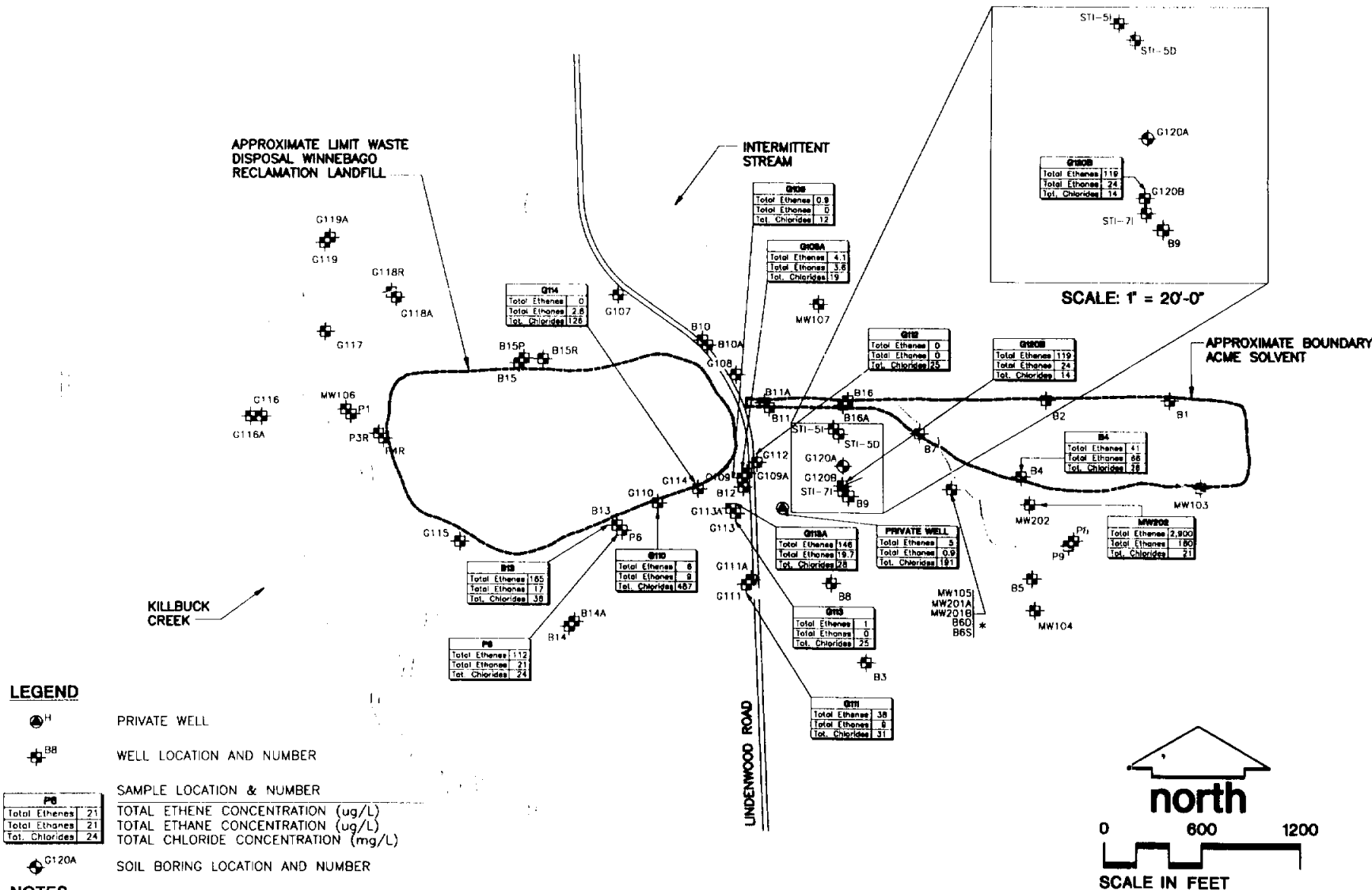
NOTES

1. SEE FIGURE 2 FOR CROSS SECTION LOCATION.
2. VOC CONCENTRATIONS ARE BASED ON ANALYSIS OF GROUNDWATER SAMPLES COLLECTED WHILE DRILLING BORE G120B AND SAMPLES COLLECTED DURING PHASE I AT NEARBY MONITORING WELLS. THE AVERAGE VALUE IS USED FOR MULTIPLE SAMPLES FROM THE SAME INTERVAL. SAMPLES WERE COLLECTED DURING THE PERIOD NOVEMBER 13 THROUGH 22.



Developed By: AUS
 Drawn By: EJR
 Approved By: *Shirley E. Parker* Date: 1/21/93
 Reference:
 Revision:
 PROFILE OF VOC CONCENTRATIONS
 CROSS SECTION A - A'
 PHASE I AND IA INVESTIGATION REPORT
 WINNEBAGO RECLAMATION LANDFILL
 ROCKFORD, ILLINOIS
 Drawing Number
 6120200 B4
 WARZYN

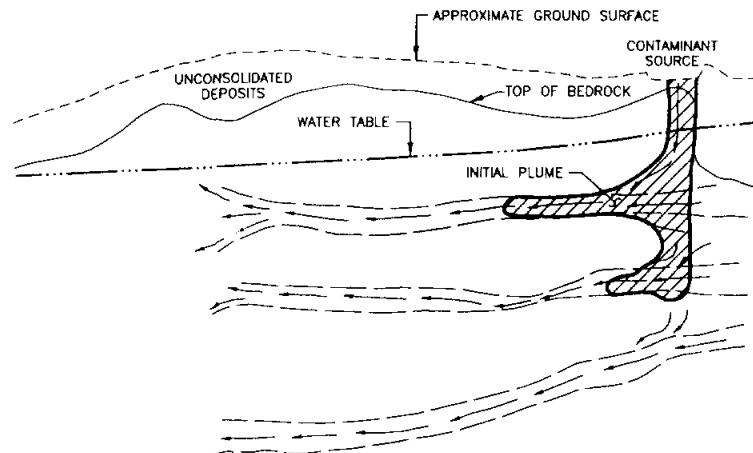
FIGURE 5



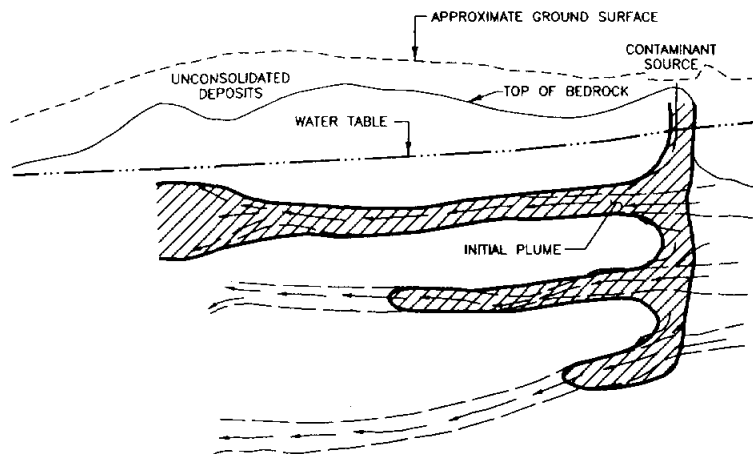
Developed By: AJS
 Drawn By: SVB/ELR
 Approved By: *Barry J. Finken*
 Date: 11/27/92
 Reference: Revision:

PHASE 1A CHLORINATED ETHENES/ETHANES
 AND CHLORIDE CONCENTRATIONS
 PHASE 1 AND 1A INVESTIGATION REPORT
 WINNEBAGO RECLAMATION LANDFILL
 ROCKFORD, ILLINOIS

FIGURE 6



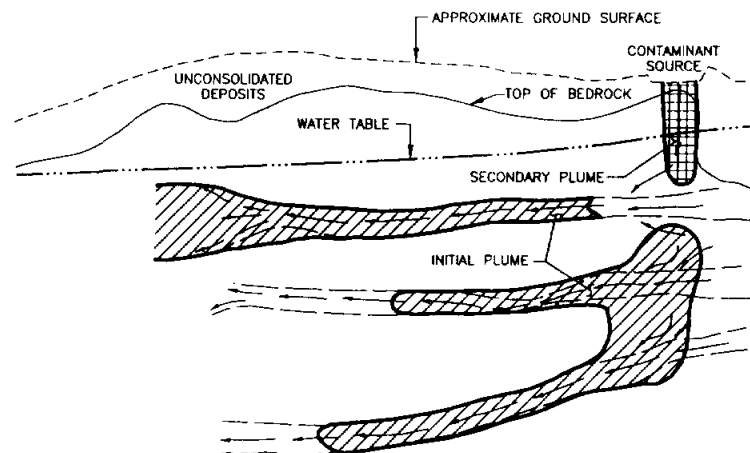
CONTAMINANT SOURCE CONSISTS PRIMARILY OF CHLORINATED ETHENES AND ETHANES. CONTAMINANTS ARE RELEASED FROM THE CONTAMINANT SOURCE AREA, MIGRATE DOWNWARD THROUGH THE UNCONSOLIDATED DEPOSITS, ENTER THE FRACTURED BEDROCK AND MIGRATE THROUGH SHALLOW AND INTERMEDIATE HIGH PERMEABILITY FRACTURE ZONES.



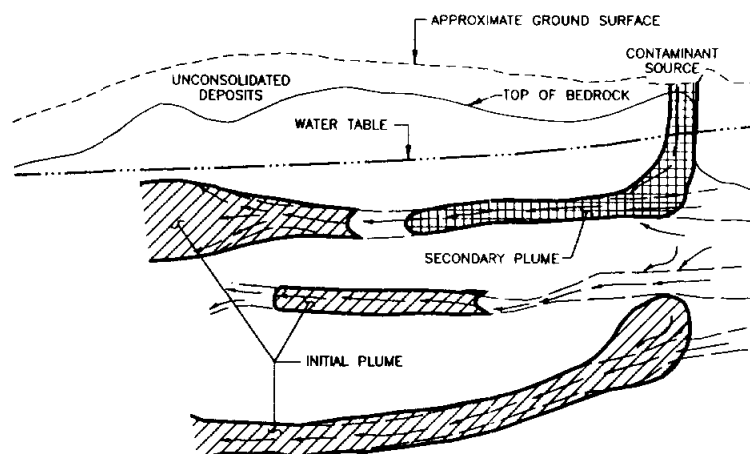
CONTAMINANTS CONTINUE TO MIGRATE Laterally THROUGH SHALLOW AND INTERMEDIATE FRACTURE ZONES. CONTAMINANTS ALSO CONTINUE TO MIGRATE DOWNWARD AND ENTER THE LOWER FRACTURE ZONE. SOURCE AREA STOPS RELEASING CHLORINATED ETHENES AND ETHANES.

NOTES

1. GROUNDWATER FLOW AND CONTAMINANT MIGRATION DIRECTION ARE SHOWN CONCEPTUALLY BASED ON DATA COLLECTED DURING PHASE I AND PHASE I/A INVESTIGATION. FOR ADDITIONAL DISCUSSION OF CONTAMINANT DISTRIBUTION REFER TO SECTION 3.4 OF TEXT.



NATURE OF CONTAMINANTS RELEASED FROM SOURCE AREA CHANGES. CHLORINATED ETHENES AND ETHANES IN THE SOURCE AREA ARE REPLACED BY TOLUENE. TRAILING EDGE OF CHLORINATED ETHENE/ETHANE PLUME MOVES AWAY FROM SOURCE AREA IN SHALLOW FRACTURE ZONE. CHLORINATED ETHENE AND ETHANES CONTINUE TO MIGRATE Laterally THROUGH THE INTERMEDIATE AND LOWER FRACTURE ZONES.



LATERAL MIGRATION OF CHLORINATED ETHENES AND ETHANES IN SHALLOW, INTERMEDIATE, AND DEEP FRACTURE ZONES CONTINUES. TRAILING EDGE OF PLUME IN SHALLOW AND INTERMEDIATE FRACTURE ZONES IS SHOWN. TOLUENE BEGINS TO MIGRATE Laterally THROUGH THE SHALLOW FRACTURE ZONE.

Developed By: AJS
 Drawn By: ELR
 Approved By: Mary E. Baker
 Date: 8/15/92
 Reference:
 Revision:

CONCEPTUAL MODEL OF CONTAMINANT MIGRATION
 IN BEDROCK FRACTURE ZONES

PHASE I AND I/A INVESTIGATION REPORT
 WINNEBAGO RECLAMATION LANDFILL
 ROCKFORD, ILLINOIS

Drawing Number
 6120200 B9



FIGURE 7



A

BORING LOGS, WELL CONSTRUCTION
DETAILS, AND PHOTOGRAPHS OF
ROCK CORE SAMPLES

ROCK BOREHOLE LOG

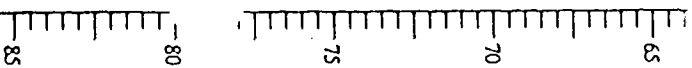
SITE NAME AND LOCATION: Winnebago Reclamation
Randall - Rockford, Illinois S.E. Corner

SHEET 2 OF 3

BORING NO.

G120A

DEPTH IN FEET (ELEVATION)	CORES			SYMBOL	ROCK LITHOLOGY AND STRUCTURE	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RESULTS	
	RUN NO.	FRACTURE FREQUENCY	RECOVERY %						ROD %	FROM
2	100	70			Gray-Brown, Medium Hard to Soft, Vuggy DOLOMITE Vugs Range From Pinhole to 1 1/2" Diameter; Mostly Horizontal Fractures with One Vertical Fracture at 38.8 to 39.1 Feet; Field Breaks at 36.9 and 38.7 Feet	HQ				
3	88	0			Medium Hard to Soft, Gray-Brown, Fractured and Vuggy DOLOMITE with Hard White Chert Seams; Few Poorly Preserved Pelecypods and Brachiopods; Vugs Range From Pinhole to 5/4" Diameter; Chert Occurs as 1 to 2" Seams and as Small (1") Modules; Most Fractures are Horizontal; Core Loss 42.8 to 43.8 White Drilling	HQ				
4	98	15			Medium Hard to Hard, Gray-Brown Vugular, Fractured DOLOMITE; Most Fractures are Horizontal; Vugs Range From Pinhole to 3/4" Diameter; Hard White Chert Seams (1" to 2" Thick) at 51.5', 53.0', 54.2', 55.5', and 57'; Very Fractured and Broken From 51.1' to 53.9'; No Discernable Fossils; No Discernable Mineralizations	HQ				
5	98	47			Hard, Gray-Brown, Mostly Solid, Vugular DOLOMITE; Vugs Range From Pinhole to 1 1/2" Diameter; Some are Calcite Filled; Mostly Horizontal Fractures; Some with Thin Glauconitic Shale Partings; No Discernable Fossils; Broken Rubby Rock From 60.6' to 61.0'	HQ				
6	100	63			Hard, Gray-Brown Mostly Solid, Vugular DOLOMITE; Vugs Range Pinhole to 3/8" Diameter; Few Calcite Crystals; Mostly Horizontal Fractures; Somewhat Arenaceous with Poorly Preserved Bedding at 73.5'; No Discernable Fossils	HQ				
7	97	39			Hard, Gray-Brown to Dark Gray, Mostly Solid, Somewhat Vugular DOLOMITE; Thin Shaley Partings; Vugs Range From Pinhole to 1/4" Diameter; Some are Calcite Filled; Few Undeformable Fossils; Broken Rock Zone at 76.2 to 76.4'; Most Fractures are Horizontal; Vertical Fracture From 82.9' to 83.5'; Apparent Change in Formation at 86' From Massive, Vugular Dolomite to Less Vugular Dolomite With Shaley Partings	HQ				



ROCK BOREHOLE LOG

SITE NAME AND LOCATION: Winnebago Reclamation
Landfill - Rockford, Illinois S.E. Corner

SHEET
3 OF 3

BORING NC.

G120A

[illegible]

ROCK BOREHOLE LOG

SITE NAME AND LOCATION: Winnebago Reclamation
1 - 4th - Rockford, Illinois S.E. Corner

DRILLING METHOD: 4.25" HSA 0-10' 5 7/8" RB w/air
10-19.5', 3 7/8" RB w/air, HQ Wireline Core 43-165.9

BORING NO.

G120B

SHEET

1 OF 4

SAMPLING METHOD:

DRILLING

START TIME FINISH TIME

BORING LOCATION:

SECTION TOWNSHIP

RANGE

NORTHING

EASTING

DATUM

ELEVATION

DRILL RIG CME 75

CASING DEPTH 10'(6") 19.5(4")

11/13/91 11/22/91

ANGLE Vertical

BEARING -----

SAMPLE HAMMER TORQUE

FT-LBS

SURFACE CONDITIONS:

DEPTH IN FEET (ELEVATION)

RUN NO.

FRACTURE FREQUENCY

RECOVERY %

RQD %

SYMBOL

ROCK LITHOLOGY AND STRUCTURE

SAMPLER AND BIT

CASING TYPE

BLOWS/FOOT ON CASING

FROM

TO

k CM/SEC

TEST RESULTS

DEPTH IN FEET

Brown, Moist, Medium Silt and CLAY, Trace Sand, Trace Gravel

Gray to Buff DOLOMITE

10 20 25 30

LOGGED BY JHR

DRILLING CONTR ETI

DATE

3/31/92

CHK'D BY

ROCK BOREHOLE LOG

SITE NAME AND LOCATION: Winnebago Reclamation
Landfill - Rockford, Illinois S.E. Corner

SHEET
2 OF 4

BCRNG NO.
G120B

DEPTH, IN FEET (ELEVATION)	CORES				SYMBOL	ROCK LITHOLOGY AND STRUCTURE	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RESULTS		
	RUN NO.	FRACTURE FREQUENCY	RECOVERY %	ROD %						DEPTH IN FEET		K CM/SEC
										FROM	TO	
40												
	1		100	10		Buff DOLOMITE Vugs Ranging From Pinhole to 1 Inch Diameter, Weathered to Semi-Weathered Chert Nodules and Seams Ranging From 1 Inch Diameter Nodules to 1 1/2 Inch Thick Seams (43.5 to 54.3)	HQ					
45	2		83	64			HQ					
	3		100	81			HQ					
50												
55												
	4		100	63		Iron Filled Fractures	HQ					
60												
	5		97	78			HQ					
65												
70												
	6		92	69		Gray DOLOMITE, Pinhole to 1/4 Inch Vugs, Well Indurated	HQ					
75	7		99	81			HQ					
80						Vertical Fracture at 80.6 to 81.0 Feet						
	8		100	92			HQ					
85						Iron Filled Fractures 84.8 to 85.5 Feet						

ROCK BOREHOLE LOG

SITE NAME AND LOCATION: Winnebago Reclamation Tandall - Rockford, Illinois S.E. Corner				SHEET 3 OF 4		BORING NO. G120B					
DEPTH IN FEET (ELEVATION)	CORES			SYMBOL	ROCK LITHOLOGY AND STRUCTURE	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RECORD		
	RUN NO.	FRACTURE FREQUENCY	RECOVERY %						RQD %	FROM	TO
9	100	57			Shaley at 87 Feet	HQ					
10	98	92			Brown to Gray DOLOMITE, Well Indurated, Varved, Iron Stained, Fine Grained, Occasional Small Vugs, Occasional Small Weathered Chert Nodules/Seams	HQ					
11	89	89			Gray, DOLOMITE Pinhole Size Vugs, Occasional Small Weathered Chert Nodules, Well Indurated	HQ					
12	100	93			Vertical Fracture 102.3 to 102.6	HQ					
13	100	92			Brown to Gray DOLOMITE Pinhole to 1/4 Inch Vugs Well Indurated	HQ					
14	98	98			Gray DOLOMITE	HQ					
15	98	71			Brown to Gray DOLOMITE, Well Indurated	HQ					
					Fracture Zone 117.2 to 117.6	HQ					
					Grades to Gray DOLOMITE Occasional Pinhole to 1/4 Inch Vugs, Well Indurated	HQ					
					Highly Fractured 135.2 to 135.3, Fractures Filled	HQ					

ROCK BOREHOLE LOG

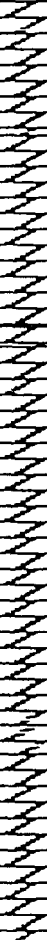
SITE NAME AND LOCATION: Winnebago Reclamation

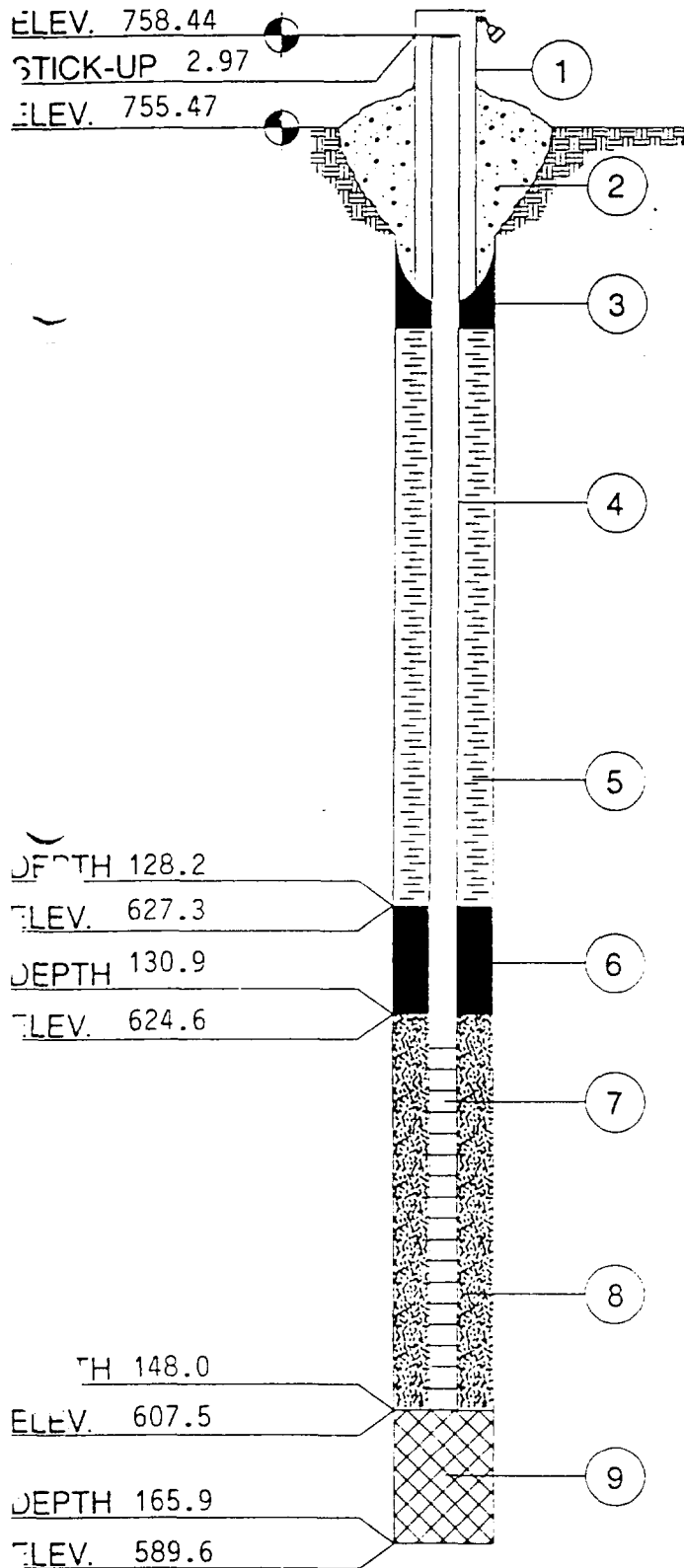
SHEET

4 OF 4

BRING NO.

G120B

DEP. IN FEET (ELEVATION)	CORES				SYMBOL	ROCK LITHOLOGY AND STRUCTURE	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RESULTS		
	RUN NO.	FRACTURE FREQUENCY	RECOVERY %	ROD %						DEPTH IN FEET		K CM/SEC
										FROM	TO	
140						Brown to Gray DOLOMITE. Infrequent Pinhole Size Vugs, Large Vug 137.4 (1 1/2 Inch Diameter), Well Indurated						
145	16		99	88		Gray DOLOMITE. Well Indurated, Occasional Pinhole to 1/4 Inch Vugs	HQ					
150	17		100	94		Brown DOLOMITE Clav. Friable Gray DOLOMITE Occasional Pinhole to 1/4 Inch Vugs, Well Indurated	HQ					
55	18		100	97			HQ					
	19		100	94			HQ					
160	20		97	94		Brown DOLOMITE. Occasional Pinhole Size Vugs, Well Indurated Gray DOLOMITE. Occasional Pinhole Size Vugs, Well Indurated	HQ					
65						End of Boring at 165.9 Feet: Backfilled with 3/8 Inch Chipped Bentonite to 148 Feet Installed Well See Well Construction Form.						
170												
175												
180												
185												



Monitoring Well Construction Information (STICK-UP)

Project Number 61202

Description Winnebago Reclamation
Landfill

Boring/
Well No G120B Date 12/3/91

1. Protective Casing Above Ground

Locking Locking Well Cap

2. Concrete
Seal 5% Bentonite/Cement

3. Type of Surface Seal (if Installed)

4. Solid Pipe
Type 304 Stainless Steel

Solid Pipe
Length 140.9

Joint Type Threaded

5. Type of
Backfill Bentonite Cement (0-10 ft)
Bentonite Chips (10-26 ft)
Bentonite Slurry (26-128.2)

Backfill Installed
Tremie

6. Type of Lower Seal (if installed)
3/8 in. Bentonite Pellets

7. Screen Type 304 Wire Wound
Continuous Slot
Stainless Steel

Screen
Length 10.1 Ft

Slot Size 0.010 in.

Slotted Interval
Length 9.6 Ft

Screen
Diameter 2.0 in.

8. Type of Backfill around Screen
Badger Mining Fine Mesh
Silica (130.9-134.8)
#30 Flint Sand (134.8-148)

9. Type of
Backfill 3/8 in. Chipped Bentonite
#5 Quartz Torpedo Sand

10. Drilling
Method HQ Wireline Core

11. Additives Used (if any)
None

All Depths Measured from Ground Surface

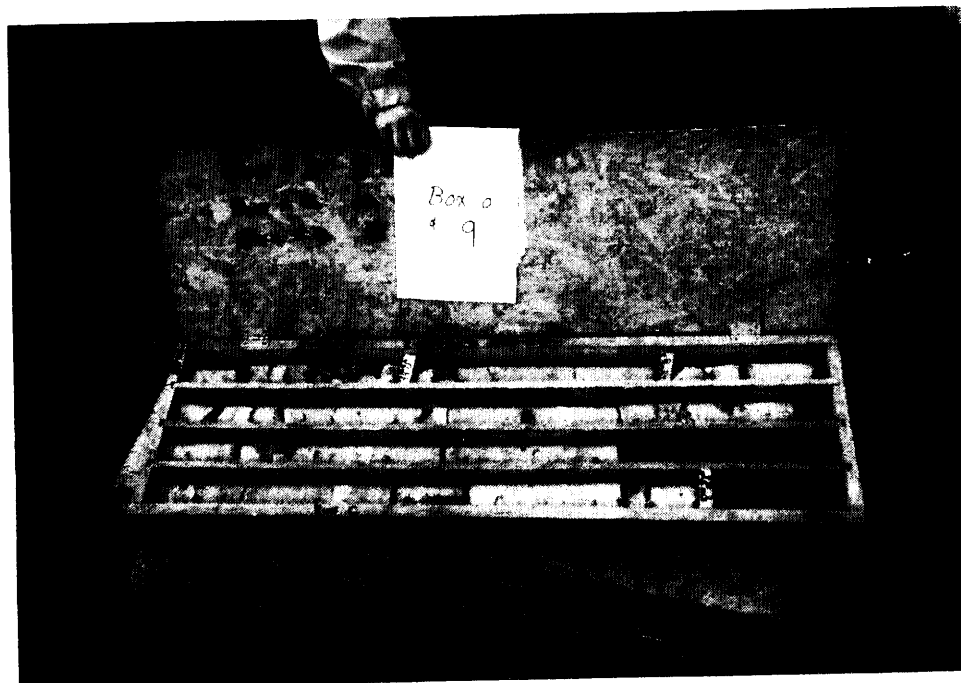
TABLE A1
KEY TO PHOTOGRAPHS OF ROCK CORES AT BORINGS G120A AND G120B

Core Run Designation On Photograph	Core Run Designation On Boring Log	Depth Interval Of Core (1)	Elevation Interval Of Core	Rock Quality Designator (RQD)
Boring G120A				
A	1	21.1 to 23.3	733.7 to 735.9	50
B	2	35.5 to 42.6	714.4 to 721.5	70
C	3	42.6 to 51.1	705.9 to 714.4	0
D	4	51.1 to 59.7	697.3 to 705.9	15
E	5	59.7 to 66.1	690.9 to 697.3	47
F	6	66.1 to 76.1	680.9 to 690.9	63
G	7	76.1 to 86.1	670.9 to 680.9	39
Boring G120B				
A	1	43.0 to 44.0	711.5 to 712.5	10
B	2	44.0 to 45.8	709.7 to 711.5	64
C	3	45.8 to 55.8	699.7 to 709.7	81
D	4	55.8 to 65.8	689.7 to 699.7	63
E	5	65.8 to 72.8	682.7 to 689.7	78
F	6	72.8 to 75.8	679.7 to 682.7	69
G	7	75.8 to 81.3	674.2 to 679.7	81
H	8	81.3 to 85.8	669.7 to 674.2	92
I	9	85.8 to 95.8	659.7 to 669.7	57
J	10	95.8 to 105.3	650.2 to 659.7	92
K	11	105.3 to 107.2	648.3 to 650.2	89
L	12	107.2 to 115.3	640.2 to 648.3	93
M	13	115.3 to 125.3	630.2 to 640.2	92
N	14	125.3 to 135.3	620.2 to 630.2	98
O	15	135.3 to 141.6	613.9 to 620.2	71
P	16	141.6 to 145.9	609.6 to 613.9	88
Q	17	145.9 to 152.9	602.6 to 609.6	94
R	18	152.9 to 155.9	599.6 to 602.6	97
S	19	155.9 to 159.0	596.5 to 599.6	94
T	20	159.0 to 165.9	589.6 to 596.5	94

(1) Depth in feet below ground surface. Ground surface elevation of G120A is approx. 757.

G120B is 755.47

ajs/coresum.xls/sci



1. Rock Core from boring G120B; Core runs A, B, and C.



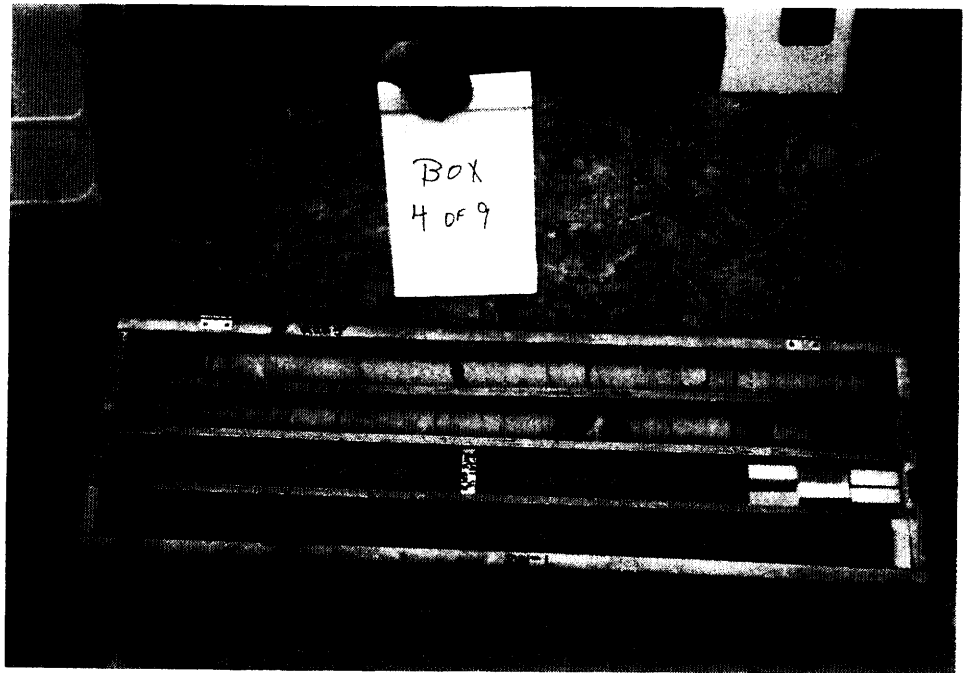
2. Rock Core from boring G120B; Core runs D and E.



3. Rock Core from boring G120B; Core runs E, F and G.



4. Rock Core from boring G120B; Core runs H, I and J.



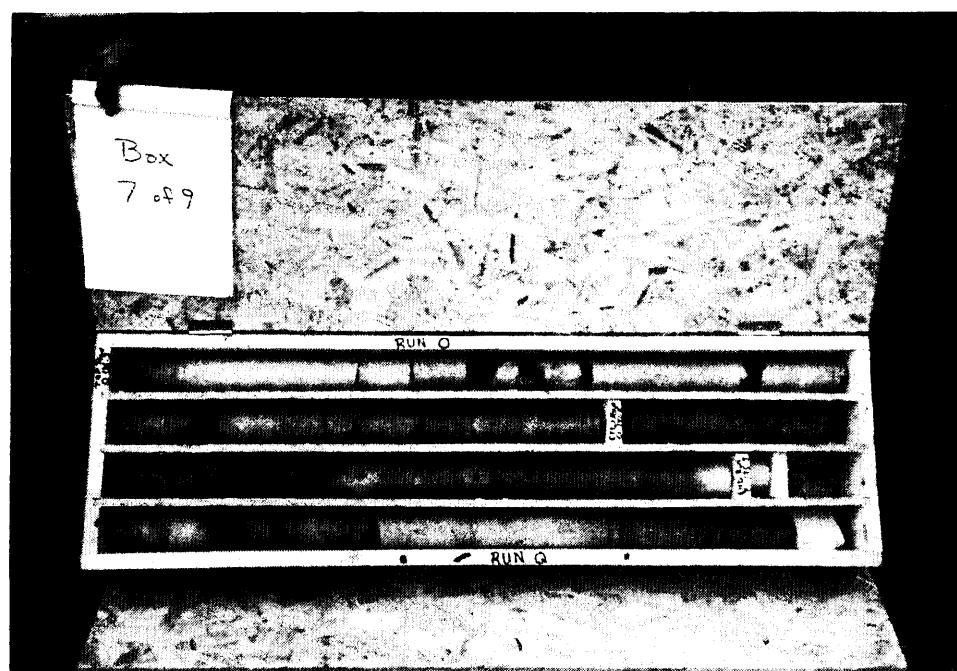
5. Rock Core from boring G120B; Core runs J, K, and L.



6. Rock Core from boring G120B; Core runs L and M.



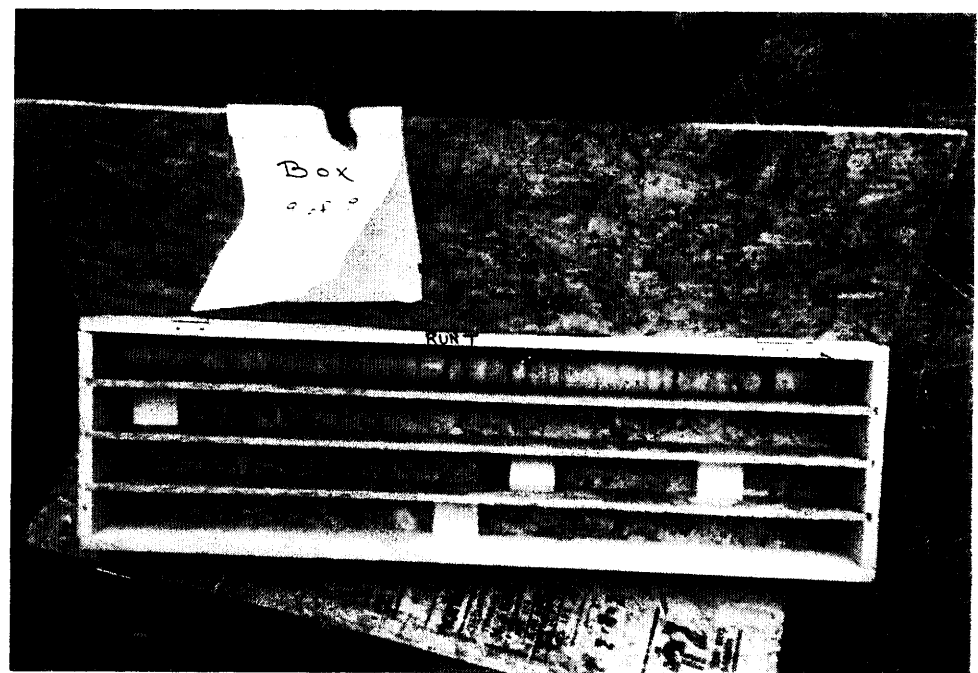
7. Rock Core from boring G120B; Core run N.



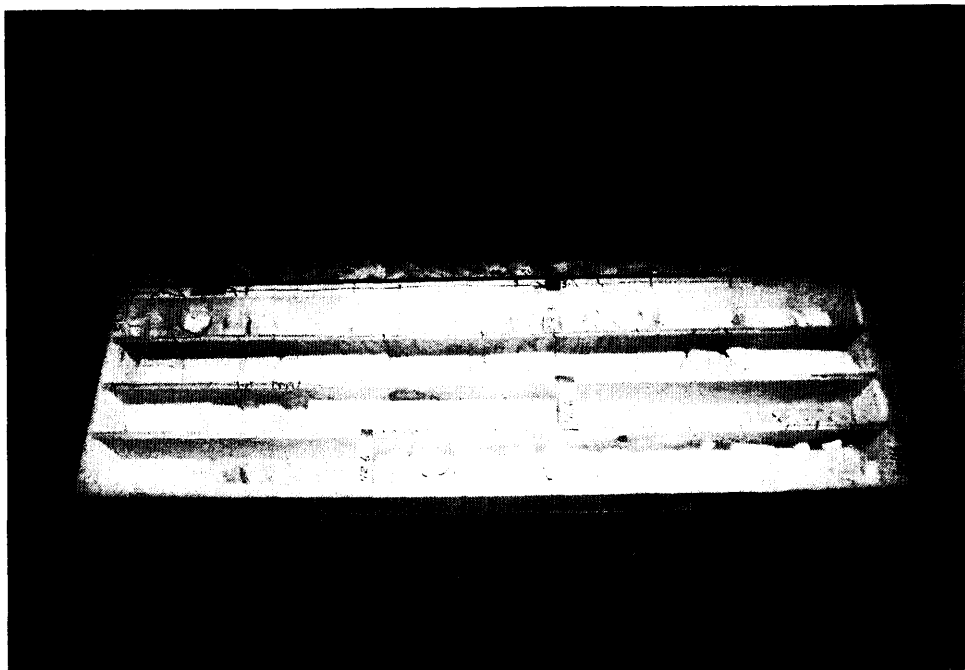
8. Rock Core from boring G120B; Core runs O, P, and Q.



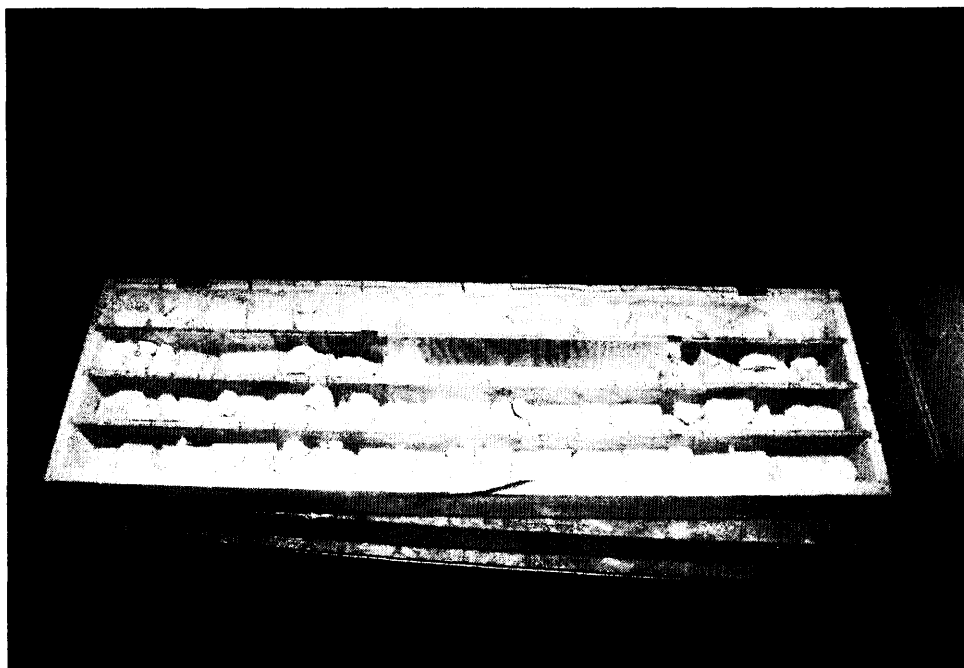
9. Rock Core from boring G120B; Core runs Q, R, S, and T.



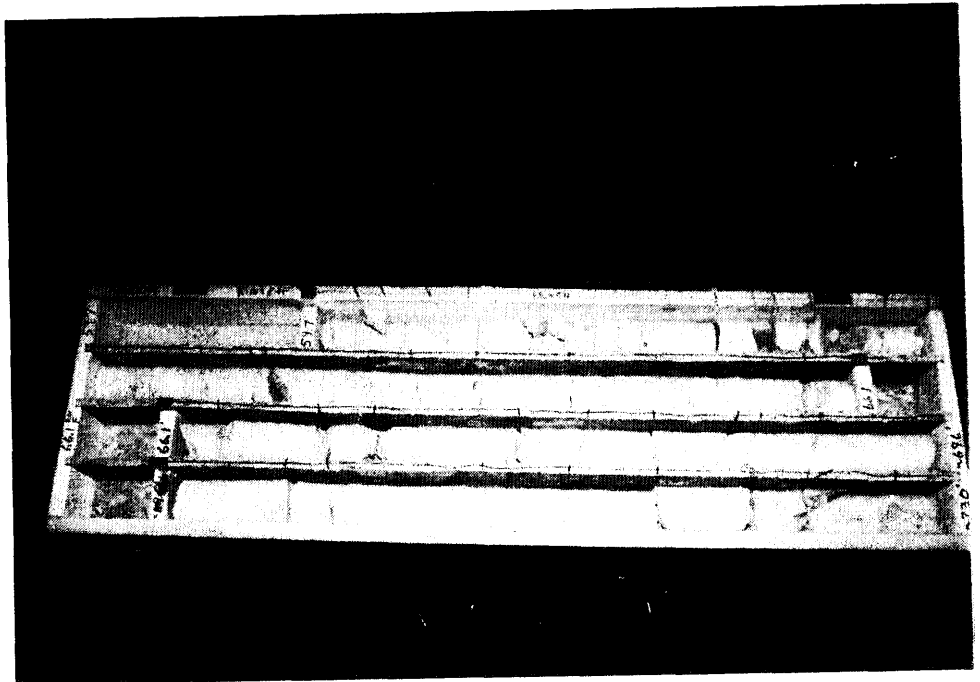
10. Rock Core from boring G120B; Core run T.



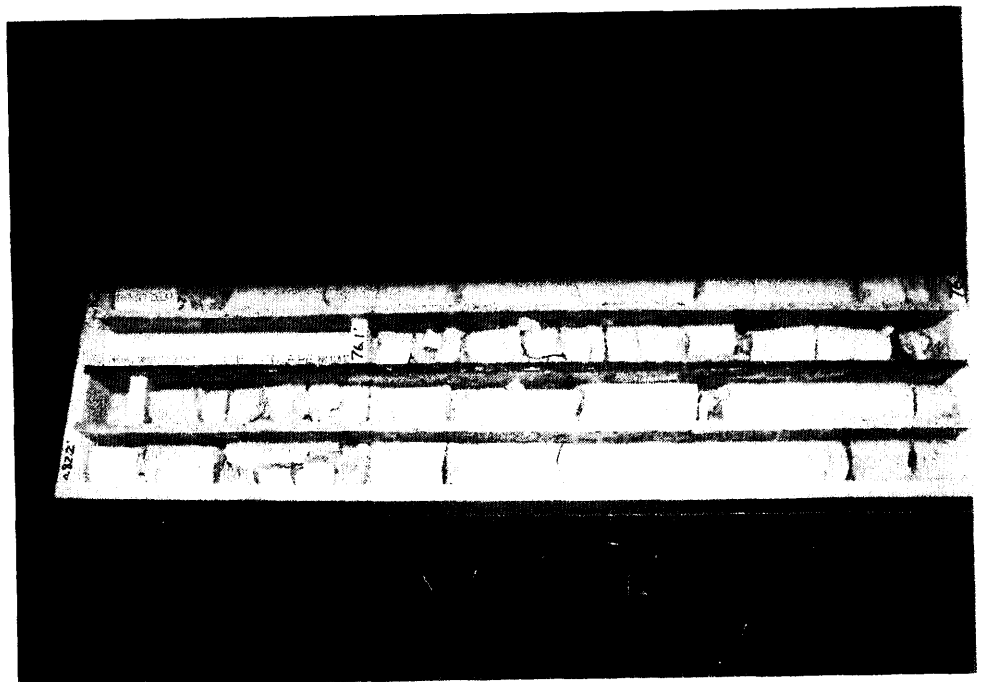
11. Rock Core from boring G120A: Core runs A and B.



12. Rock Core from boring G120A: Core runs B, C, and D.



13. Rock Core from boring G120A; Core runs E and F.



14. Rock Core from boring G120A; Core runs F and G.

B

WELL DEVELOPMENT INFORMATION



LABORATORY RESULTS VOLATILE ORGANIC REPORT

Project: Winnebago Landfill

Project #: 61202.02

Location: Rockford, Illinois

Date Sampled: 12/17/91

<u>Compound</u>	<u>Reporting Limits (ug/L)</u>	<u>3810-001 G120B - Development</u>
Benzene	1.0	<1.0
Bromodichloromethane	1.0	<1.0
Bromoform	1.0	<1.0
Bromomethane	2.0	<2.0
Carbon tetrachloride	1.0	<1.0
Chlorobenzene	1.0	<1.0
Chlorodibromomethane	1.0	<1.0
Chloroethane	2.0	4.5
2-Chloroethylvinyl ether	10	<10
Chloroform	1.0	<1.0
Chloromethane	2.0	<2.0
1,2-Dichlorobenzene	1.0	<1.0
1,3-Dichlorobenzene	1.0	<1.0
1,4-Dichlorobenzene	1.0	<1.0
1,1-Dichloroethane	1.0	14
1,2-Dichloroethane	1.0	2.2
1,1-Dichloroethene	1.0	2.5
cis-1,2-Dichloroethene	1.0	100
trans-1,2-Dichloroethene	1.0	<1.0
1,2-Dichloropropane	1.0	1.0
cis-1,3-Dichloropropene	1.0	<1.0
trans-1,3-Dichloropropene	1.0	<1.0
Ethylbenzene	1.0	<1.0
Methylene chloride	3.0	<3.0
1,1,2,2-Tetrachloroethane	1.0	<1.0
Tetrachloroethene	1.0	10
Toluene	1.0	2.3
1,1,1-Trichloroethane	1.0	13
1,1,2-Trichloroethane	1.0	<1.0
Trichloroethene	1.0	17
Trichlorofluoromethane	1.0	<1.0
Vinyl chloride	1.0	10
m and p-Xylene	2.0	3.1
o-Xylene	1.0	<1.0

Method Reference: SW846, "Test Methods for Evaluating Solid Waste", November 1986, Method 8010/8020.

C

LABORATORY ANALYTICAL
INFORMATION - PHASE IA

C1

WARZYN INC. LABORATORY DATA*

- * Target Compound List organics analyzed by Compuchem
- * Target Analyte List inorganic and indicators analyzed by Warzyn Inc.

TABLE C1
Summary of Field Observations and Field Measurements
January 16 and 17 Phase IA Groundwater Sampling
Winnebago Reclamation Landfill

<u>Well No.</u>	<u>pH</u>	<u>Conductivity (umhos/cm)</u>	<u>Temperature (°C)</u>	<u>Conductivity at 25°C (umhos/cm)</u>	<u>Odor</u>	<u>Color</u>	<u>Turbidity</u>
G109	6.53	750	7.5	1150	None	Light Tan	Moderate
G113	6.73	750	6.5	1190	None	Light Brown	Moderate
G113A	6.77	780	2.5	1420	None	Clear	None
FB01	6.87	<10	4.5	<10	None	Clear	None
PWH	6.65	1200	11.5	1640	None	Clear	None
G109A	6.71	750	9.5	1090	None	Light Brown	Moderate
MW202	7.35	275	5.2	455	Slight Solvent	Light Brown	Moderate
G120B	7.90	375	6	605	Stale	Clear	Slight
G120B-91	7.87	365	5.5	600	Stale	Clear	Slight
G114	6.49	1220	8.5	1820	Septic	Light Gray	Very Slight
G114-91	6.49	1200	8.5	1790	Septic	Light Gray	Very Slight
G110	7.33	3850	3.5	6750	Septic	Gray	Moderate
G111	7.17	400	4	690	None	Beige	Moderate
B13	6.73	780	7.5	1200	Slight Septic	Light Brown	Very Slight
P6	7.20	420	7.5	645	None	Light Brown	Moderate
G112	7.35	700	8	1060	None	Light Brown	Moderate
FB02	5.47	<10	5.5	<10	None	Clear	None

TABLE C1 (continued)
Summary of Field Observations and Field Measurements
January 16 and 17 Phase IA Groundwater Sampling
Winnebago Reclamation Landfill

Sample ID	Water Level⁽¹⁾	Total Well Depth⁽¹⁾	Well Volume (gallons)	Volume Purged (gallons)
G109	41.10	53.70	2.1	6.5
G113	43.98	51.00	1.2	4.0
G113A	44.83	78.00	5.5	12
G109A	41.49	81.60	6.5	8.5
MW202	26.18	125.60	16	49
G120B	38.40	150.1	18	65
G114	39.66	48.0	1.3	2.5
G110	32.9	45.6	2.0	6
B13	26.05	35.50	1.5	4.5
P6	26.66	52.2	4.0	13
PW11				Pump ran for 25 min.

Note:

(1) = Water levels and well depths are measured in feet below ground surface.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
Rockford, IL

1

Matrix: GW Type: LVOC
Generated by: JAH
Date Issued: 31-MAR-92

	WR-GW-B13-01 01/17/92			WR-GW-B4-01 01/17/92			WR-GW-FB01-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	5.		U/	62.		U/	1.
Bromomethane (UG/L)		U/	5.		U/	62.		U/	1.
Vinyl chloride (UG/L)	15.	/	5.		U/	62.		U/	1.
Chloroethane (UG/L)		U/	5.	120.	/	62.		U/	1.
Methylene chloride (UG/L)		B/U	26.		B/U	190.		B/U	4.
Acetone (UG/L)		U/	25.		U/	310.		U/	5.
Carbon disulfide (UG/L)		U/	5.		U/	62.		U/	1.
1,1-Dichloroethene (UG/L)		U/	5.		U/	62.		U/	1.
1,1-Dichloroethane (UG/L)	14.	/	5.	66.	/	62.		U/	1.
cis-1,2-Dichloroethene (UG/L)	120.	/	5.	41.	J/J	62.		U/	1.
trans-1,2-Dichloroethene (UG/L)		U/	5.		U/	62.		U/	1.
Chloroform (UG/L)		U/	5.		U/	62.		U/	1.
1,2-Dichloroethane (UG/L)		U/	5.		U/	62.		U/	1.
2-Butanone (UG/L)		U/	25.		U/	310.		U/	5.
Bromochloromethane (UG/L)		U/	5.		U/	62.		U/	1.
1,1,1-Trichloroethane (UG/L)	3.	J/J	5.		U/	62.		U/	1.
Carbon tetrachloride (UG/L)		U/	5.		U/	62.		U/	1.
Bromodichloromethane (UG/L)		U/	5.		U/	62.		U/	1.
1,2-Dichloropropane (UG/L)	6.	/	5.		U/	62.		U/	1.
cis-1,3-Dichloropropene (UG/L)		U/	5.		U/	62.		U/	1.
Trichloroethene (UG/L)	28.	/	5.		U/	62.		U/	1.
Dibromochloromethane (UG/L)		U/	5.		U/	62.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	5.		U/	62.		U/	1.
Benzene (UG/L)		U/	5.		U/	62.		U/	1.
trans-1,3-Dichloropropene (UG/L)		U/	5.		U/	62.		U/	1.
Bromoform (UG/L)		U/	5.		U/	62.		U/	1.
1,2-Dibromoethane (UG/L)		U/	5.		U/	62.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	25.	5600.	/	310.		U/	5.
2-Hexanone (UG/L)		U/	25.		U/	310.		U/	5.
Tetrachloroethene (UG/L)	17.	/	5.		U/	62.		U/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	5.		U/	62.		U/	1.
Toluene (UG/L)		U/	5.	730.	/	62.		U/	1.
Chlorobenzene (UG/L)		U/	5.		U/	62.		U/	1.
Ethylbenzene (UG/L)		U/	5.	170.	/	62.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA
Winnebago Reclamation Landfill
Rockford, IL

8

Matrix: GW Type: LVOC

	WR-GW-B13-01 01/17/92			WR-GW-B4-01 01/17/92			WR-GW-FB01-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	5.		U/	62.		U/	1.
Xylenes (total) (UG/L)		U/	5.	800.	/	62.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	5.		U/	62.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	5.		U/	62.		U/	1.
1,4-Dichlorobenzene (UG/L)	10.	/	5.		U/	62.		U/	1.
1,2-Dichlorobenzene (UG/L)		U/	5.		U/	62.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
Rockford, IL

2

Matrix: GW Type: LVOC

	WR-GW-FB02-01 01/17/92			WR-GW-G109-01 01/16/92			WR-GW-G109A-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	1.		U/	1.		U/	1.
Bromomethane (UG/L)		U/	1.		U/	1.		U/	1.
Vinyl chloride (UG/L)		U/	1.		U/	1.		U/	1.
Chloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Methylene chloride (UG/L)		B/U	3.		B/U	5.		B/U	3.
Acetone (UG/L)		U/	5.		U/	5.		U/	5.
Carbon disulfide (UG/L)		U/	1.		U/	1.		U/	1.
1,1-Dichloroethene (UG/L)		U/	1.		U/	1.		U/	1.
1,1-Dichloroethane (UG/L)		U/	1.		U/	1.	0.5	J/J	1.
cis-1,2-Dichloroethene (UG/L)		U/	1.		U/	1.	2.	/	1.
trans-1,2-Dichloroethene (UG/L)		U/	1.		U/	1.		U/	1.
Chloroform (UG/L)		U/	1.	2.	/	1.	0.7	J/J	1.
1,2-Dichloroethane (UG/L)		U/	1.		U/	1.		U/	1.
2-Butanone (UG/L)		U/	5.		U/	5.		U/	5.
Bromochloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,1,1-Trichloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Carbon tetrachloride (UG/L)		U/	1.		U/	1.		U/	1.
Bromodichloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dichloropropane (UG/L)		U/	1.		U/	1.		U/	1.
cis-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.		U/	1.
Trichloroethene (UG/L)		U/	1.		U/	1.	0.6	J/J	1.
Dibromochloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Benzene (UG/L)		U/	1.		U/	1.		U/	1.
trans-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.		U/	1.
Bromoform (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dibromoethane (UG/L)		U/	1.		U/	1.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	5.		U/	5.		U/	5.
2-Hexanone (UG/L)		U/	5.		U/	5.		U/	5.
Tetrachloroethene (UG/L)		U/	1.	0.9	J/J	1.	1.	/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Toluene (UG/L)		U/	1.		U/	1.		U/	1.
Chlorobenzene (UG/L)		U/	1.		U/	1.		U/	1.
Ethylbenzene (UG/L)		U/	1.		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA
Winnebago Reclamation Landfill
Rockford, IL

9

Matrix: GW Type: LVOC

	WR-GW-FB02-01 01/17/92			WR-GW-G109-01 01/16/92			WR-GW-G109A-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	1.		U/	1.		U/	1.
Xylenes (total) (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	1.		U/	1.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	1.		U/	1.		U/	1.
1,4-Dichlorobenzene (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dichlorobenzene (UG/L)		U/	1.		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
Rockford, IL

3

Matrix: GW Type: LVOC

	WR-GW-G110-01 01/16/92			WR-GW-G111-01 01/17/92			WR-GW-G112-01 01/17/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	2.		U/	1.		U/	1.
Bromomethane (UG/L)		U/	2.		U/	1.		U/	1.
Vinyl chloride (UG/L)		U/	2.		U/	1.		U/	1.
Chloroethane (UG/L)	17.	/	2.		U/	1.		U/	1.
Methylene chloride (UG/L)		BJ/U	3.		B/U	10.		BJ/U	1.
Acetone (UG/L)	7.	J/J	10.		U/	5.		U/	5.
Carbon disulfide (UG/L)		U/	2.		U/	1.		U/	1.
1,1-Dichloroethene (UG/L)		U/	2.		U/	1.		U/	1.
1,1-Dichloroethane (UG/L)	7.	/	2.	3.	/	1.		U/	1.
cis-1,2-Dichloroethene (UG/L)	2.	/	2.	22.	/	1.		U/	1.
trans-1,2-Dichloroethene (UG/L)	2.	/	2.		U/	1.		U/	1.
Chloroform (UG/L)		U/	2.		U/	1.		U/	1.
1,2-Dichloroethane (UG/L)	2.	/	2.		U/	1.		U/	1.
2-Butanone (UG/L)		U/	10.		U/	5.		U/	5.
Bromochloromethane (UG/L)		U/	2.		U/	1.		U/	1.
1,1,1-Trichloroethane (UG/L)		U/	2.	6.	/	1.		U/	1.
Carbon tetrachloride (UG/L)		U/	2.		U/	1.		U/	1.
Bromodichloromethane (UG/L)		U/	2.		U/	1.		U/	1.
1,2-Dichloropropane (UG/L)	3.	/	2.		U/	1.		U/	1.
cis-1,3-Dichloropropene (UG/L)		U/	2.		U/	1.		U/	1.
Trichloroethene (UG/L)	2.	/	2.	6.	/	1.		U/	1.
Dibromochloromethane (UG/L)		U/	2.		U/	1.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	2.		U/	1.		U/	1.
Benzene (UG/L)	10.	/	2.		U/	1.		U/	1.
trans-1,3-Dichloropropene (UG/L)		U/	2.		U/	1.		U/	1.
Bromoform (UG/L)		U/	2.		U/	1.		U/	1.
1,2-Dibromoethane (UG/L)		U/	2.		U/	1.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	10.		U/	5.		U/	5.
2-Hexanone (UG/L)		U/	10.		U/	5.		U/	5.
Tetrachloroethene (UG/L)		U/	2.	10.	/	1.		U/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	2.		U/	1.		U/	1.
Toluene (UG/L)	2.	/	2.		U/	1.		U/	1.
Chlorobenzene (UG/L)	10.	/	2.		U/	1.		U/	1.
Ethylbenzene (UG/L)	36.	/	2.		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
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Matrix: GW Type: LVOC

Parameter	WR-GW-G110-01 01/16/92			WR-GW-G111-01 01/17/92			WR-GW-G112-01 01/17/92		
	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	2.		U/	1.		U/	1.
Xylenes (total) (UG/L)	80.	E/J	2.		U/	1.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	2.		U/	1.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	2.		U/	1.		U/	1.
1,4-Dichlorobenzene (UG/L)	31.	/	2.		U/	1.		U/	1.
1,2-Dichlorobenzene (UG/L)	4.	/	2.		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

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Matrix: GW Type: LVOC

	WR-GW-G113-01 01/16/92			WR-GW-G113A-01 01/16/92			WR-GW-G114-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	1.		U/	1.		U/	1.
Bromomethane (UG/L)		U/	1.		U/	1.		U/	1.
Vinyl chloride (UG/L)		U/	1.	13.	/	1.		U/	1.
Chloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Methylene chloride (UG/L)		B/U	7.		B/U	7.		B/U	7.
Acetone (UG/L)		U/	5.		U/	5.		U/	5.
Carbon disulfide (UG/L)		U/	1.		U/	1.		U/	1.
1,1-Dichloroethene (UG/L)		U/	1.		U/	1.		U/	1.
1,1-Dichloroethane (UG/L)		U/	1.	18.	/	1.	2.	/	1.
cis-1,2-Dichloroethene (UG/L)		U/	1.	87.	E/	1.		U/	1.
trans-1,2-Dichloroethene (UG/L)		U/	1.	3.	/	1.		U/	1.
Chloroform (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dichloroethane (UG/L)		U/	1.	1.	/	1.		U/	1.
2-Butanone (UG/L)		U/	5.		U/	5.		U/	5.
Bromochloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,1,1-Trichloroethane (UG/L)		U/	1.	0.7	J/J	1.		U/	1.
Carbon tetrachloride (UG/L)		U/	1.		U/	1.		U/	1.
Bromodichloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dichloropropane (UG/L)		U/	1.	5.	/	1.	2.	/	1.
cis-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.		U/	1.
Trichloroethene (UG/L)		U/	1.	39.	E/	1.		U/	1.
Dibromochloromethane (UG/L)		U/	1.		U/	1.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Benzene (UG/L)		U/	1.	2.	/	1.	0.8	J/J	1.
trans-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.		U/	1.
Bromoform (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dibromoethane (UG/L)		U/	1.		U/	1.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	5.		U/	5.		U/	5.
2-Hexanone (UG/L)		U/	5.		U/	5.		U/	5.
Tetrachloroethene (UG/L)	1.	/	1.	17.	/	1.		U/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	1.		U/	1.		U/	1.
Toluene (UG/L)		U/	1.		U/	1.		U/	1.
Chlorobenzene (UG/L)		U/	1.	0.8	J/J	1.	1.	/	1.
Ethylbenzene (UG/L)		U/	1.		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
Rockford, IL

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Matrix: GW Type: LVOC

	WR-GW-G113-01 01/16/92			WR-GW-G113A-01 01/16/92			WR-GW-G114-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	1.		U/	1.		U/	1.
Xylenes (total) (UG/L)		U/	1.		U/	1.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	1.		U/	1.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	1.		U/	1.		U/	1.
1,4-Dichlorobenzene (UG/L)		U/	1.	4.	/	1.	13.	/	1.
1,2-Dichlorobenzene (UG/L)		U/	1.		U/	1.	1.	/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

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Matrix: GW Type: LVOC

Parameter	WR-GW-G114-91 01/16/92			WR-GW-G120B-01 01/17/92			WR-GW-G120B-91 01/17/92		
	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	1.		U/	4.		U/	4.
Bromomethane (UG/L)		U/	1.		U/	4.		U/	4.
Vinyl chloride (UG/L)		U/	1.	6.	/	4.	6.	/	4.
Chloroethane (UG/L)		U/	1.		U/	4.		U/	4.
Methylene chloride (UG/L)		B/U	8.		B/U	15.		B/U	12.
Acetone (UG/L)		U/	5.		U/	20.		U/	20.
Carbon disulfide (UG/L)		U/	1.		U/	4.		U/	4.
1,1-Dichloroethene (UG/L)		U/	1.		U/	4.		U/	4.
1,1-Dichloroethane (UG/L)	3.	/	1.	12.	/	4.	12.	/	4.
cis-1,2-Dichloroethene (UG/L)		U/	1.	94.	/	4.	81.	/	4.
trans-1,2-Dichloroethene (UG/L)		U/	1.		U/	4.		U/	4.
Chloroform (UG/L)		U/	1.		U/	4.		U/	4.
1,2-Dichloroethane (UG/L)		U/	1.		U/	4.		U/	4.
2-Butanone (UG/L)		U/	5.		U/	20.		U/	20.
Bromochloromethane (UG/L)		U/	1.		U/	4.		U/	4.
1,1,1-Trichloroethane (UG/L)		U/	1.	12.	/	4.	11.	/	4.
Carbon tetrachloride (UG/L)		U/	1.		U/	4.		U/	4.
Bromodichloromethane (UG/L)		U/	1.		U/	4.		U/	4.
1,2-Dichloropropane (UG/L)	2.	/	1.		U/	4.		U/	4.
cis-1,3-Dichloropropene (UG/L)		U/	1.		U/	4.		U/	4.
Trichloroethene (UG/L)		U/	1.	16.	/	4.	14.	/	4.
Dibromochloromethane (UG/L)		U/	1.		U/	4.		U/	4.
1,1,2-Trichloroethane (UG/L)		U/	1.		U/	4.		U/	4.
Benzene (UG/L)	0.8	J/J	1.		U/	4.		U/	4.
trans-1,3-Dichloropropene (UG/L)		U/	1.		U/	4.		U/	4.
Bromoform (UG/L)		U/	1.		U/	4.		U/	4.
1,2-Dibromoethane (UG/L)		U/	1.		U/	4.		U/	4.
4-Methyl-2-pentanone (UG/L)		U/	5.		U/	20.		U/	20.
2-Hexanone (UG/L)		U/	5.		U/	20.		U/	20.
Tetrachloroethene (UG/L)		U/	1.	9.	/	4.	7.	/	4.
1,1,2,2-Tetrachloroethane (UG/L)		U/	1.		U/	4.		U/	4.
Toluene (UG/L)		U/	1.		U/	4.		U/	4.
Chlorobenzene (UG/L)	2.	/	1.		U/	4.		U/	4.
Ethylbenzene (UG/L)		U/	1.		U/	4.		U/	4.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
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Matrix: GW Type: LVOC

	WR-GW-G114-91 01/16/92			WR-GW-G120B-01 01/17/92			WR-GW-G120B-91 01/17/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	1.		U/	4.		U/	4.
Xylenes (total) (UG/L)		U/	1.		U/	4.		U/	4.
1,2-Dibromo-3-chloropropane (UG/L)		U/	1.		U/	4.		U/	4.
1,3-Dichlorobenzene (UG/L)		U/	1.		U/	4.		U/	4.
1,4-Dichlorobenzene (UG/L)	16.	/	1.		U/	4.		U/	4.
1,2-Dichlorobenzene (UG/L)	1.	/	1.		U/	4.		U/	4.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

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Matrix: GW Type: LVOC

	WR-GW-MW202-01 01/17/92			WR-GW-P6-01 01/17/92			WR-GW-TB01-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	170.		U/	3.		U/	1.
Bromomethane (UG/L)		U/	170.		U/	3.		U/	1.
Vinyl chloride (UG/L)	600.	/	170.		U/	3.		U/	1.
Chloroethane (UG/L)		U/	170.		U/	3.		U/	1.
Methylene chloride (UG/L)		B/U	860.		B/U	6.		B/U	3.
Acetone (UG/L)		U/	850.		U/	15.		U/	5.
Carbon disulfide (UG/L)		U/	170.		U/	3.		U/	1.
1,1-Dichloroethene (UG/L)		U/	170.		U/	3.		U/	1.
1,1-Dichloroethane (UG/L)	160.	J/J	170.	6.	/	3.		U/	1.
cis-1,2-Dichloroethene (UG/L)	2900.	/	170.	46.	/	3.		U/	1.
trans-1,2-Dichloroethene (UG/L)		U/	170.		U/	3.		U/	1.
Chloroform (UG/L)		U/	170.		U/	3.		U/	1.
1,2-Dichloroethane (UG/L)		U/	170.		U/	3.		U/	1.
2-Butanone (UG/L)		U/	850.		U/	15.		U/	5.
Bromochloromethane (UG/L)		U/	170.		U/	3.		U/	1.
1,1,1-Trichloroethane (UG/L)		U/	170.	15.	/	3.		U/	1.
Carbon tetrachloride (UG/L)		U/	170.		U/	3.		U/	1.
Bromodichloromethane (UG/L)		U/	170.		U/	3.		U/	1.
1,2-Dichloropropane (UG/L)		U/	170.		U/	3.		U/	1.
cis-1,3-Dichloropropene (UG/L)		U/	170.		U/	3.		U/	1.
Trichloroethene (UG/L)		U/	170.	22.	/	3.		U/	1.
Dibromochloromethane (UG/L)		U/	170.		U/	3.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	170.		U/	3.		U/	1.
Benzene (UG/L)		U/	170.		U/	3.		U/	1.
trans-1,3-Dichloropropene (UG/L)		U/	170.		U/	3.		U/	1.
Bromoform (UG/L)		U/	170.		U/	3.		U/	1.
1,2-Dibromoethane (UG/L)		U/	170.		U/	3.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	850.		U/	15.		U/	5.
2-Hexanone (UG/L)		U/	850.		U/	15.		U/	5.
Tetrachloroethene (UG/L)		U/	170.	44.	/	3.		U/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	170.		U/	3.		U/	1.
Toluene (UG/L)		U/	170.		U/	3.		U/	1.
Chlorobenzene (UG/L)		U/	170.		U/	3.		U/	1.
Ethylbenzene (UG/L)		U/	170.		U/	3.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill
Rockford, IL

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Matrix: GW Type: LVOC

Parameter	WR-GW-MW202-01 01/17/92			WR-GW-P6-01 01/17/92			WR-GW-TB01-01 01/16/92		
	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	170.		U/	3.		U/	1.
Xylenes (total) (UG/L)		U/	170.		U/	3.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	170.		U/	3.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	170.		U/	3.		U/	1.
1,4-Dichlorobenzene (UG/L)		U/	170.		U/	3.		U/	1.
1,2-Dichlorobenzene (UG/L)		U/	170.		U/	3.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

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Rockford, IL

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Matrix: GW Type: LVOC

	WR-GW-TB02-01 01/17/92			WR-PW-PWH-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Chloromethane (UG/L)		U/	1.		U/	1.
Bromomethane (UG/L)		U/	1.		U/	1.
Vinyl chloride (UG/L)		U/	1.		U/	1.
Chloroethane (UG/L)		U/	1.		U/	1.
Methylene chloride (UG/L)		B/U	3.		B/U	4.
Acetone (UG/L)		U/	5.		U/	5.
Carbon disulfide (UG/L)		U/	1.		U/	1.
1,1-Dichloroethene (UG/L)		U/	1.		U/	1.
1,1-Dichloroethane (UG/L)		U/	1.	0.9	J/J	1.
cis-1,2-Dichloroethene (UG/L)		U/	1.	2.	/	1.
trans-1,2-Dichloroethene (UG/L)		U/	1.		U/	1.
Chloroform (UG/L)		U/	1.		U/	1.
1,2-Dichloroethane (UG/L)		U/	1.		U/	1.
2-Butanone (UG/L)		U/	5.		U/	5.
Bromochloromethane (UG/L)		U/	1.		U/	1.
1,1,1-Trichloroethane (UG/L)		U/	1.		U/	1.
Carbon tetrachloride (UG/L)		U/	1.		U/	1.
Bromodichloromethane (UG/L)		U/	1.		U/	1.
1,2-Dichloropropane (UG/L)		U/	1.		U/	1.
cis-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.
Trichloroethene (UG/L)		U/	1.	1.	/	1.
Dibromochloromethane (UG/L)		U/	1.		U/	1.
1,1,2-Trichloroethane (UG/L)		U/	1.		U/	1.
Benzene (UG/L)		U/	1.		U/	1.
trans-1,3-Dichloropropene (UG/L)		U/	1.		U/	1.
Bromoform (UG/L)		U/	1.		U/	1.
1,2-Dibromoethane (UG/L)		U/	1.		U/	1.
4-Methyl-2-pentanone (UG/L)		U/	5.		U/	5.
2-Hexanone (UG/L)		U/	5.		U/	5.
Tetrachloroethene (UG/L)		U/	1.	2.	/	1.
1,1,2,2-Tetrachloroethane (UG/L)		U/	1.		U/	1.
Toluene (UG/L)		U/	1.		U/	1.
Chlorobenzene (UG/L)		U/	1.		U/	1.
Ethylbenzene (UG/L)		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
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Rockford, IL

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Matrix: GW Type: LVOC

Parameter	WR-GW-TB02-01 01/17/92			WR-PW-PWH-01 01/16/92		
	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Styrene (UG/L)		U/	1.		U/	1.
Xylenes (total) (UG/L)		U/	1.		U/	1.
1,2-Dibromo-3-chloropropane (UG/L)		U/	1.		U/	1.
1,3-Dichlorobenzene (UG/L)		U/	1.		U/	1.
1,4-Dichlorobenzene (UG/L)		U/	1.		U/	1.
1,2-Dichlorobenzene (UG/L)		U/	1.		U/	1.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill

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Matrix: GW Type: MTL IND
Generated by: JAH
Date Issued: 31-MAR-92

	WR-GW-B13-01 01/17/92			WR-GW-B4-01 01/17/92			WR-GW-FB01-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)		U/	2.	7.	B/	2.		U/	2.
Barium (UG/L)	149.	B/	10.	824.	/	10.		U/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)	141000.	/	1000.	56400.	/	1000.		U/	1000.
Magnesium (UG/L)	65700.	/	1000.	78700.	/	1000.		U/	1000.
Potassium (UG/L)	34100.	B/	100.	1930.	B/	100.		U/	100.
Sodium (UG/L)	15600.	/	1000.	6400.	/	1000.		U/	1000.
Alkalinity, Total (MG/L)	605.	/	10.					U/	10.
Chloride (MG/L)	36.	/	2.	26.	/	2.		U/	2.
Sulfate (MG/L)	43.	N/	10.		U/	10.		UN/	10.

Note: Conc = Concentration of parameter detected in the sample, (DVQ = Laboratory Qualifier/Data Validation) Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill

2

Matrix: GW Type: MTL IND

	WR-GW-FB02-01 01/17/92			WR-GW-G109-01 01/16/92			WR-GW-G109A-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)		U/	2.		U/	2.		U/	2.
Barium (UG/L)		U/	10.	117.	B/	10.	169.	B/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)		U/	1000.	177000.	/	1000.	149000.	/	1000.
Magnesium (UG/L)		U/	1000.	49600.	/	1000.	47100.	/	1000.
Potassium (UG/L)		U/	100.	490.	B/	100.	790.	B/	100.
Sodium (UG/L)		U/	1000.	7500.	/	1000.	10000.	/	1000.
Alkalinity, Total (MG/L)		U/	10.	632.	/	10.	600.	/	10.
Chloride (MG/L)		U/	2.	12.	/	2.	19.	/	2.
Sulfate (MG/L)		UN/	10.	16.	N/	10.	14.	N/	10.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill

3

Matrix: GW Type: MTL IND

	WR-GW-G110-01 01/16/92			WR-GW-G111-01 01/17/92			WR-GW-G112-01 01/17/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)	52.5	/	2.		U/	2.		U/	2.
Barium (UG/L)	1010.	/	10.	51.	B/	10.	63.	B/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)	58400.	/	1000.	73300.	/	1000.	123000.	/	1000.
Magnesium (UG/L)	110000.	/	1000.	35600.	/	1000.	64400.	/	1000.
Potassium (UG/L)	392000.	/	100.	2720.	B/	100.	550.	B/	100.
Sodium (UG/L)	591000.	/	1000.	7300.	/	1000.	15800.	/	1000.
Alkalinity, Total (MG/L)	2060.	/	10.	259.	/	10.	466.	/	10.
Chloride (MG/L)	487.	/	2.	31.	/	2.	25.	/	2.
Sulfate (MG/L)	25.	N/	10.	32.	N/	10.	111.	N/	10.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA REPORT
Winnebago Reclamation Landfill

4

Matrix: GW Type: MTL IND

	WR-GW-G113-01 01/16/92			WR-GW-G113A-01 01/16/92			WR-GW-G114-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)	6.2	B/	2.		U/	2.	17.6	/	2.
Barium (UG/L)	81.	B/	10.	130.	B/	10.	480.	/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)	145000.	/	1000.	164000.	/	1000.	202000.	/	1000.
Magnesium (UG/L)	61200.	/	1000.	66900.	/	1000.	81800.	/	1000.
Potassium (UG/L)	7800.	/	100.	6460.	/	100.	4220.	B/	100.
Sodium (UG/L)	23700.	/	1000.	60100.	/	1000.	78300.	/	1000.
Alkalinity, Total (MG/L)	571.	/	10.	772.	/	10.	814.	/	10.
Chloride (MG/L)	25.	/	2.	28.	/	2.	126.	/	2.
Sulfate (MG/L)	73.	N/	10.	41.	N/	10.	94.	N/	10.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA
Winnebago Reclamation Landfill

5

Matrix: GW Type: MTL IND

	WR-GW-G114-91 01/16/92			WR-GW-G120B-01 01/17/92			WR-GW-G120B-91 01/17/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)	11.2	/	2.		U/	2.		U/	2.
Barium (UG/L)	488.	/	10.	63.	B/	10.	64.	B/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)	212000.	/	1000.	65800.	/	1000.	62900.	/	1000.
Magnesium (UG/L)	81500.	/	1000.	35200.	/	1000.	34300.	/	1000.
Potassium (UG/L)	3730.	B/	100.	19300.	/	100.	17900.	/	100.
Sodium (UG/L)	73900.	/	1000.	8800.	/	1000.	8400.	/	1000.
Alkalinity, Total (MG/L)	812.	/	10.	293.	/	10.	296.	/	10.
Chloride (MG/L)	143.	/	2.	14.	/	2.	14.	/	2.
Sulfate (MG/L)	95.	N/	10.	31.	N/	10.	32.	N/	10.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

ANALYTICAL DATA JRT
Winnebago Reclamation Landfill

6

Matrix: GW Type: MTL IND

	WR-GW-MW202-01 01/17/92			WR-GW-P6-01 01/17/92			WR-PW-PWH-01 01/16/92		
Parameter	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Arsenic (UG/L)	2.4	B/	2.		U/	2.		U/	2.
Barium (UG/L)	472.	/	10.	60.	B/	10.	115.	B/	10.
Cadmium (UG/L)		U/	5.		U/	5.		U/	5.
Calcium (UG/L)	41500.	/	1000.	74400.	/	1000.	179000.	/	1000.
Magnesium (UG/L)	26600.	/	1000.	39800.	/	1000.	80000.	/	1000.
Potassium (UG/L)	1250.	B/	100.	1250.	B/	100.	720.	B/	100.
Sodium (UG/L)	5000.	/	1000.	5600.	/	1000.	63400.	/	1000.
Alkalinity, Total (MG/L)	199.	/	10.	274.	/	10.	550.	/	10.
Chloride (MG/L)	21.	/	2.	24.	/	2.	191.	/	2.
Sulfate (MG/L)	14.	N/	10.	38.	N/	10.	59.	N/	10.

Note: Conc = Concentration of parameter detected in the sample, LQ/DVQ = Laboratory Qualifier/Data Validation Qualifier, RDL = Reported Detection Limit.

SUMMARY OF TENTATIVELY IDENTIFIED COMPOUNDS
Winnebago Reclamation Landfill
Rockford, IL

1

Matrix: GW
Generated by: JAH
Date Issued: 31-MAR-92

WR-GW-B4-01 01/17/92

(TVOA) Tentatively-Identified Volatiles

Compound (Units)	Concentration	LQ/DVQ
Trimethylbenzene (UG/L)	160.	J/JN
Unknown (UG/L)	240.	J/JN

WR-GW-G110-01 01/16/92

(TVOA) Tentatively-Identified Volatiles

Compound (Units)	Concentration	LQ/DVQ
Unknown substituted hydrazin (UG/L)	77.	J/JN
Ethylmethylbenzene (UG/L)	40.	J/JN
Trimethylbenzene (UG/L)	31.	J/JN
Ethylmethylbenzene (UG/L)	42.	J/JN
Trimethylbenzene (UG/L)	150.	J/JN
Unknown substituted benzene (UG/L)	27.	J/JN
Trimethylbenzene (UG/L)	59.	J/JN
Unknown substituted benzene (UG/L)	21.	J/JN

WR-GW-G113A-01 01/16/92

(TVOA) Tentatively-Identified Volatiles

Compound (Units)	Concentration	LQ/DVQ
Methane, dichlorofluoro- (UG/L)	13.	JN/JN



CHAIN OF CUSTODY RECORD

Warzyn Engineering Inc.
P.O. Box 5385
Wisconsin 53705
(608) 273-0440

PROJ. NO.		PROJECT NAME		LOCATION		SAMPLERS: (Signature)		NO. OF CONTAINERS		REMARKS	
LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO.	OF	CONTAINERS	TAG #'S	REMARKS	
6120200 8139	1/17/92	0730		X	WR-GW-TB02	130	2	X	9-03019, 20	GWTB02-01	
-001	1/17/92	0900			WR-GW-B4-01	4	X		9-03101, 02, 03, 04	WRGWB4-01	
-002		0920			WR-GW-G111-01	4	X		9-03149, 50, 51, 52	WRG111-01	
-003		0940			WR-GW-MW202-01	4	X		9-03003, 04, 05, 06	WRMW202-01	
-004		1240			WR-GW-G120B-01	4	X		9-03079, 80, 81, 82	WRG120B-01	
-005					WR-GW-G120B-91	4	X		9-03085, 86, 87, 88	WRG120B-91	
-006		11:00	X		WR-GWB13-01	4	X		9-03119, 20, 21, 22	WRGWB13-01	
-007		12:25	X		WR-GWP6-01	4	X		9-03073, 74, 75, 76	WRGWP6-01	
-008		13:20	X		WR-GWFB02-01	4	X		9-03143, 44, 45, 46	WRGFB02-01	
-009		14:30	X		WR-GW-G112-01	4	X		9-03055, 56, 57, 58	WRG112-01	
RECEIVED IN GOOD CONDITION											
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Thomas J. Duschitz		1/17/92 1840									
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
				A. Schmidt				01-1898-0930			
Remarks: Shipped To: Compu Chem Lab										PROJECT MANAGER: TSD 1/17/92 K. B. A. Schmidt	
Custody Seals: 90010945, 90010946 A: bill # 3038082246 Shipped via: Federal Express											



CHAIN OF CUSTODY RECORD

Walzyn Engineering Inc.
University Research Park
P.O. Box 5385
Milwaukee, Wisconsin 53705
(608) 273-0440

PROJ. NO.		PROJECT NAME		LOCATION		NO. OF CONTAINERS		REMARKS	
6120200 8139		Winnebago Reclamation L.F.		Rockford, IL				* WR-GW-G110-01 MSD 1-00A BROKE Recu. Accd. 5/17/92	
SAMPLERS: (Signature)									
[Signatures]									
LAB NO.	DATE	TIME	COMP.	GRAB	STATION/LOCATION				
3944-010	1/16/92	13:00		X	WR-GW-G114-01	4	X	475343	9-03067, 68, 69, 70 WR-G114-01
-011		↓		X	WR-GW-G114-91	4	X	475345	9-03131, 32, 33, 34 W-G114-91
-012		1120		X	WR-GW-G109-01	4	X	475346	9-03107, 08, 09, 10 W-G109-01
-013		1410		X	WR-GW-G113-01	4	X	475348	9-03061, 62, 63, 64 W-G113-01
-014		1445		X	WR-GW-G113A-01	4	X	475349	9-03113, 14, 15, 16 -G113A-01
-015		14:40		X	WR-GW-G110-01	4	X	475350	9-03091, 92, 93, 94 W-G110-01
-020		14:40		X	WR-GW-G110-01 MSD	4	X		9-03009, 10, 11, 12
↓		14:40		X	WR-GW-G110-01 MSD	4	X		9-03013, 14, 15, 16
-016		15:10		X	WR-GW-FB01-01	4	X	475351	9-03137, 38, 39, 40 W-FB01-01
-017		15:40		X	WR-PW-PWH-01	4	X	475352	9-03125, 26, 27, 28 PW-PWH-01
-018		16:10		X	WR-GW-G109A-01	4	X	475353	9-03098, 9-03097, 9-03001, 9-03002
↓ -019	✓	0700		X	WR-GW-TB01-01	2	X	475354	9-03017, 18 W-TB01-01
- G109A-01									
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time	
[Signature]		1/16/92 1700							
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time			
				V Batte		1/17/92 0845			
Remarks						PROJECT MANAGER: Al Schmidt			
Run sample by low level method						Shipped via: Federal Express			
Shipped To: Comp. Chem Lab						A-i-bi 11 # 3037082235			
						Custody Seals: None			
						RECEIVED IN GOOD CONDITION			

C2

LABORATORY DATA PROVIDED BY
HARDING LAWSON ASSOCIATES

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N.

Lab Name: HAZLET Contract: _____
 Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
 Matrix: (soil/water) WATER Lab Sample ID: 20103443
 Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A184
 Level: (low/med) LOW Date Received: 01/17/92
 % Moisture: not dec. _____ Date Analyzed: 01/27/92
 Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L g

74-87-3	Chloromethane	10	10J
74-83-9	Bromomethane	10	10J
75-01-4	Vinyl Chloride	4	1J
75-00-3	Chloroethane	110	1J
75-09-2	Methylene Chloride	5.2	UBJ
67-64-1	Acetone	370	3E
75-15-0	Carbon Disulfide	5	10J
75-35-4	1,1-Dichloroethene	0.4	1J
75-34-3	1,1-Dichloroethane	63	1J
540-59-0	1,2-Dichloroethene (total)	28	1J
67-66-3	Chloroform	5	10J
107-06-2	1,2-Dichloroethane	5	10J
78-93-3	2-Butanone	120	1J
71-55-6	1,1,1-Trichloroethane	7	1J
56-23-5	Carbon Tetrachloride	5	10J
108-05-4	Vinyl Acetate	10	10J
75-27-4	Bromodichloromethane	5	10J
78-87-5	1,2-Dichloropropane	12	1J
10061-01-5	cis-1,3-Dichloropropene	5	10J
79-01-6	Trichloroethene	6	10J
124-48-1	Dibromochloromethane	5	10J
79-00-5	1,1,2-Trichloroethane	5	10J
71-43-2	Benzene	19	10J
10061-02-6	Trans-1,3-Dichloropropene	5	10J
75-25-2	Bromoform	5	10J
108-10-1	4-Methyl-2-Pentanone	3000	3E
591-78-6	2-Hexanone	4	1J
127-18-4	Tetrachloroethene	5.2	UBJ
79-34-5	1,1,2,2-Tetrachloroethane	5	10J
108-88-3	Toluene	760	3BE
108-90-7	Chlorobenzene	5	10J
100-41-4	Ethylbenzene	180	10J
100-42-5	Styrene	13	1J
1330-20-7	Xylenes (total)	530	3BEX

VALIDATED

Reviewed By [Signature]
 Date 3-28-92

FORM 1 VOA

1/87 R

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE #

B4

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103443
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A184
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/27/92
Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 8 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 109-99-9	FURAN, TETRAHYDRO-	9.35	220	1JN
2. 625-27-4	2-PENTENE, 2-METHYL-	14.85	6.4	1JN
3. 108-11-2	2-PENTANOL, 4-METHYL-	19.70	94	1JN
4. 110-12-3	2-HEXANONE, 5-METHYL-	23.60	79	1JN
5. 18450-73-2	1-HEPTANOL, 2,4-DIMETHYL-, (24.05	7.7	1JN
6. 106-68-3	3-OCTANONE	27.01	13	1JN
7. 873-94-9	CYCLOHEXANONE, 3,3,5-TRIMETHI	28.76	1300	1JN
8. 103-65-1	BENZENE, PROPYL-	29.71	6.4	1JN

VALIDATED

Reviewed By *J. E. L.*
Date 3-28-92

FORM 1 VOA-TIC

1/87 F

1A:
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

B4DL

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103443
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A231
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/31/92
Column: (pack/cap) PACK Dilution Factor: 50

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	g
74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	110	JD
75-09-2	Methylene Chloride	82	BJD
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	56	JD
340-59-0	1,2-Dichloroethene (total)	38	JD
67-66-3	Chloroform	12	JD
107-06-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
108-05-4	Vinyl Acetate	500	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	100	JD
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	25	JD
10061-02-6	Trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	4700	JD
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	720	JD
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	160	BJD
100-42-5	Styrene	250	U
1330-20-7	Xylenes (total)	460	BJD

VALIDATED

Reviewed By [Signature]
Date 3-28-92

FORM I VOA

1/87 R

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

84DL

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103443
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A231
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/31/92
Column (pack/cap) PACK Dilution Factor: 50

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	G.
1. 108-38-3	BENZENE, 1,3-DIMETHYL-	27.91	460	JON
2. 873-94-9	CYCLOHEXANONE, 3,3,5-TRIMETHI	28.86	470	JON

VALIDATED

Reviewed By [Signature]

Date 3-28-92

FORM I VOA-TIC

1/87 Re

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

202

Lab Name: HAZLET

Contract: _____

Lab Code: HAZLET

Case No.: HALB

SAS No.: _____

SDG No.: 103443

Matrix: (soil/water) WATER

Lab Sample ID: 20103444

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 2015A185

Level: (low/med) LOW

Date Received: 01/17/92

% Moisture: not dec. _____

Date Analyzed: 01/27/92

Column: (pack/cap) PACK

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L G

74-87-3	Chloromethane	10	1U
74-83-9	Bromomethane	10	1U
75-01-4	Vinyl Chloride	340	1E
75-00-3	Chloroethane	6	1U
75-09-2	Methylene Chloride	5.2	UBX
67-64-1	Acetone	22	1U
75-15-0	Carbon Disulfide	5	1U
75-35-4	1,1-Dichloroethene	18	
75-34-3	1,1-Dichloroethane	140	
540-59-0	1,2-Dichloroethene (total)	1300	1E
67-66-3	Chloroform	5	1U
107-06-2	1,2-Dichloroethane	26	
78-93-3	2-Butanone	10	1U
71-55-6	1,1,1-Trichloroethane	15	
56-23-5	Carbon Tetrachloride	5	1U
75-27-4	Bromodichloromethane	5	1U
78-87-5	1,2-Dichloropropane	4	1U
10061-01-3	cis-1,3-Dichloropropene	5	1U
79-01-6	Trichloroethene	19	UB
124-48-1	Dibromochloromethane	5	1U
79-00-5	1,1,2-Trichloroethane	5	
71-43-2	Benzene	6	1B
10061-02-6	Trans-1,3-Dichloropropene	5	1U
75-25-2	Bromoform	5	1U
108-10-1	4-Methyl-2-Pentanone	330	1E
591-78-6	2-Hexanone	10	1U
127-18-4	Tetrachloroethene	16	1B
79-34-5	1,1,2,2-Tetrachloroethane	5	1U
108-88-3	Toluene	32	1B
108-90-7	Chlorobenzene	0.11	1U
100-41-4	Ethylbenzene	12	1B
100-42-5	Styrene	5	1U
1330-20-7	Xylenes (total)	22	1BX

VALIDATED

Reviewed By [Signature]

FORM 1 VOA

1/87

Date 3-18-92

HARDING LAWSON VOA

P.24

FAX NO. 303 894 9948

HARDING LAWSON ASSOC.

APR-30-92 THU 14:53

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

202
MW-202

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103444
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A185
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/27/92
Column (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 3

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108-67-8	BENZENE, 1,3,5-TRIMETHYL-	19.95	68	JN
2. 503-45-7	CYCLOHEXENE, 3,3,5-TRIMETHYL	23.95	14	JN
3. 873-94-9	CYCLOHEXANONE, 3,3,5-TRIMETH	28.86	260	JN

VALIDATED

Reviewed By [Signature]
Date 3-28-92

FORM 1 VOA-TIC

1/87

HARDING LAWSON VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MLV-202
202DL

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAB No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103444
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A212
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/30/92
Column: (pack/cap) PACK Dilution Factor: 10

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L g

74-87-3	Chloromethane	100	U
74-83-9	Bromomethane	100	U
75-01-4	Vinyl Chloride	26	U
75-00-3	Chloroethane	100	U
75-09-2	Methylene Chloride	14	BJD
67-64-1	Acetone	100	U
75-15-0	Carbon Disulfide	50	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	110	U
540-59-0	1,2-Dichloroethene (total)	1400	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	100	U
71-55-6	1,1,1-Trichloroethane	50	U
56-23-5	Carbon Tetrachloride	50	U
108-05-4	Vinyl Acetate	100	U
75-27-4	Bromodichloromethane	50	U
78-87-5	1,2-Dichloropropane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
79-01-6	Trichloroethene	59	BJD
124-48-1	Dibromochloromethane	50	U
79-00-5	1,1,2-Trichloroethane	50	U
71-43-2	Benzene	8	BJD
10061-02-6	Trans-1,3-Dichloropropene	50	U
75-25-2	Bromoform	50	U
108-10-1	4-Methyl-2-Pentanone	100	U
591-78-6	2-Hexanone	100	U
127-18-4	Tetrachloroethene	13	BJD
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-88-3	Toluene	23	BJD
108-90-7	Chlorobenzene	50	U
100-41-4	Ethylbenzene	9	BJD
100-42-5	Styrene	50	U
1330-20-7	Xylenes (total)	15	BJXD

VALIDATED

Reviewed By [Signature]

FORM I VOA

1/87

Date 3-28-92

HARDING LAWSON VOA

P. 26

FAX NO. 303 894 9948

HARDING LAWSON ASSOC.

APR-30-92 THU 14:54

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

HW-203
202DL

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103444
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A212
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/30/92
Column (pack/cap) PACK Dilution Factor: 10

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 873-94-9	CYCLOHEXANONE, 3,3,5-TRIMETH	28.96	110	100N

VALIDATED

Reviewed By RLH

Date 3-28-92

FORM 1 VOA-TIC

1/87 F

HARDING LAWSON VOA

P. 27

FAX NO. 303 894 9948

HARDING LAWSON ASSOC.

APR-30-92 THU 14:55

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MMW-03
202RE

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103444
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A203
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/29/92
Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L G

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	340	IE
75-00-3	Chloroethane	6	U
75-09-2	Methylene Chloride	5.2	UB
67-64-1	Acetone	21	UB
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	17	
75-34-3	1,1-Dichloroethane	120	
540-59-0	1,2-Dichloroethane (total)	1400	IE
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	22	
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	17	
56-23-5	Carbon Tetrachloride	3	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	4	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethane	25	B
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	4	U
71-43-2	Benzene	5	B
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	38	
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	16	B
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	21	B
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	10	B
100-42-5	Styrene	5	U
1330-20-7	Xylenes (total)	16	UB

VALIDATED

Reviewed By [Signature]
Date 3-18-92

FORM 1 VOA

1/87

HARDING LAWSON VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MD-209
202RE

Lab Name: HAZLET Contract: _____
Lab Code: HAZLET Case No.: HALB SAS No.: _____ SDG No.: 103443
Matrix: (soil/water) WATER Lab Sample ID: 20103444
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 2015A203
Level: (low/med) LOW Date Received: 01/17/92
% Moisture: not dec. _____ Date Analyzed: 01/29/92
Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 873-94-9	CYCLOHEXANONE, 3,3,5-TRIMETH	28.96	78	JN

VALIDATED

Reviewed By RAEHL
Date 3-28-92

FORM 1 VOA-TIC

1/87 R

P. 29

FAX NO. 303.894.9948

HARDING LAWSON ASSOC.

APR-30-92 THU 14:56

HARDING LAWSON VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

G1203
90050001

Lab Name: HAZLET Contract: _____
Lab Code: _____ Case No.: HALB SAS No.: _____ SDG No.: 201711
Matrix: (soil/water) WATER Lab Sample ID: 20201711
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 202CA153
Level: (low/med) LOW Date Received: 02/12/92
% Moisture: not dec. _____ Date Analyzed: 02/22/92
Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	10 IU
74-83-9	Bromomethane	10 IU
75-01-4	Vinyl Chloride	10 IU
75-00-3	Chloroethane	10 IU
75-09-2	Methylene Chloride	5.0 0.708
67-64-1	Acetone	10 IU
75-15-0	Carbon Disulfide	5 IU
75-35-4	1,1-Dichloroethene	2 IU
75-34-3	1,1-Dichloroethane	10 IU
540-59-0	1,2-Dichloroethane (total)	46 IU
67-66-3	Chloroform	5 IU
107-06-2	1,2-Dichloroethane	5 IU
78-93-3	2-Butanone	10 IU
71-55-6	1,1,1-Trichloroethane	13 IU
56-23-5	Carbon Tetrachloride	2 IU
108-05-4	Vinyl Acetate	10 IU
75-27-4	Bromodichloromethane	5 IU
78-87-5	1,2-Dichloropropane	5 IU
10061-01-5	cis-1,3-Dichloropropene	5 IU
79-01-6	Trichloroethene	20 IU
124-48-1	Dibromochloromethane	5 IU
79-00-5	1,1,2-Trichloroethane	5 IU
71-43-2	Benzene	5 IU
10061-02-6	Trans-1,3-Dichloropropene	5 IU
75-25-2	Bromoform	5 IU
108-10-1	4-Methyl-2-Pentanone	10 IU
591-78-6	2-Hexanone	10 IU
127-18-4	Tetrachloroethene	10 IU
79-34-5	1,1,2,2-Tetrachloroethane	5 IU
108-88-3	Toluene	5 IU
108-90-7	Chlorobenzene	5 IU
100-41-4	Ethylbenzene	5 IU
100-42-5	Styrene	5 IU
1330-20-7	Xylenes (total)	5 IU

VALIDATED

Reviewed By JH E
Date 3-28-92

FORM I VOA

1/87 Rev.

HARDING LAWSON VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

G120B
90050001

Lab Name: HAZLET Contract: _____
Lab Code: _____ Case No.: HALB SAS No.: _____ SDG No.: 201711
Matrix: (soil/water) WATER Lab Sample ID: 20201711
Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 202CA153
Level: (low/med) LOW Date Received: 02/12/92
% Moisture: not dec. _____ Date Analyzed: 02/22/92
Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	G
=====	=====	=====	=====	=====
=====	=====	=====	=====	=====

VALIDATED

Reviewed By [Signature]
Date 3-28-92

FORM 1 VOA-TIC

1/87 Rev.

HARDING LAWSON UDR

P. 37

FAX NO. 303 894 9948

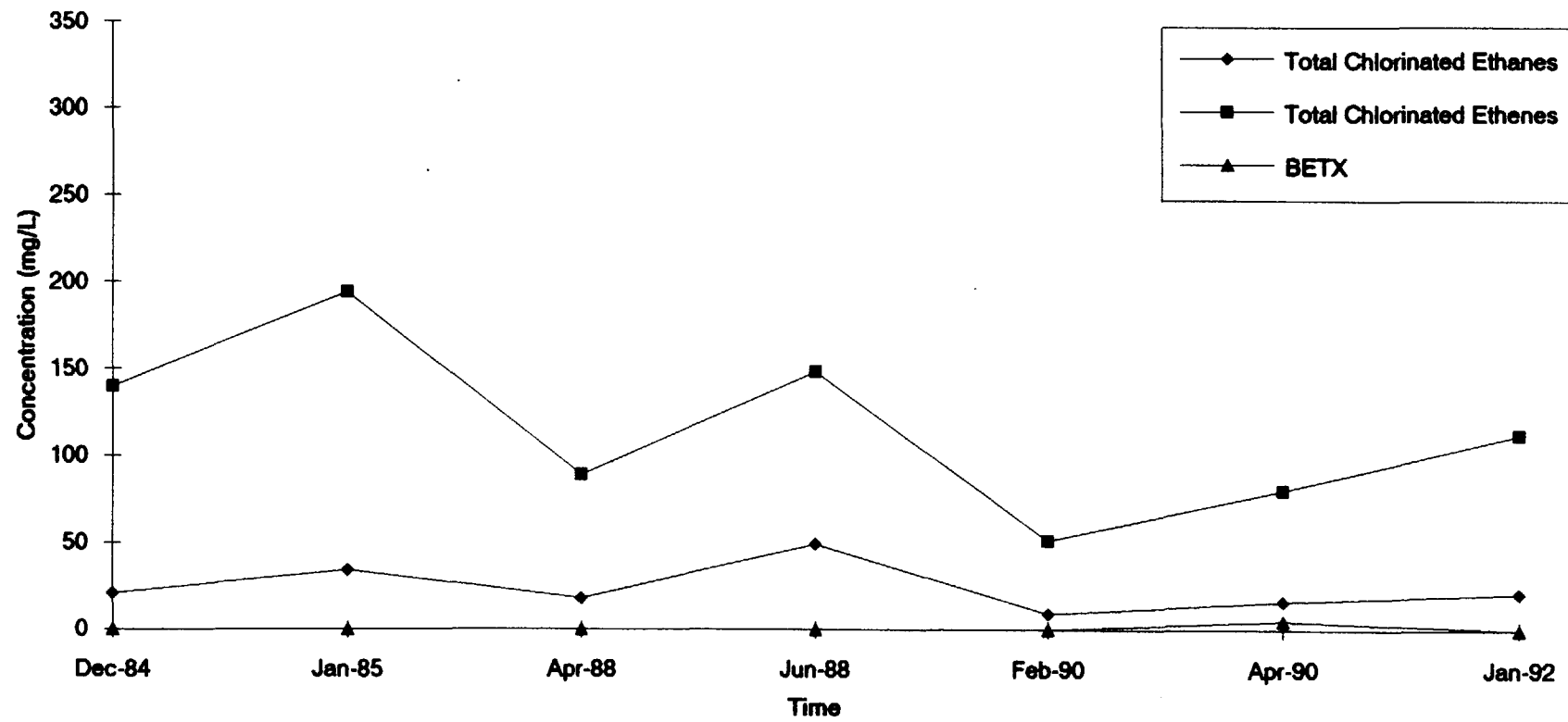
HARDING LAWSON ASSOC.

APR-30-92 THU 14:59

D

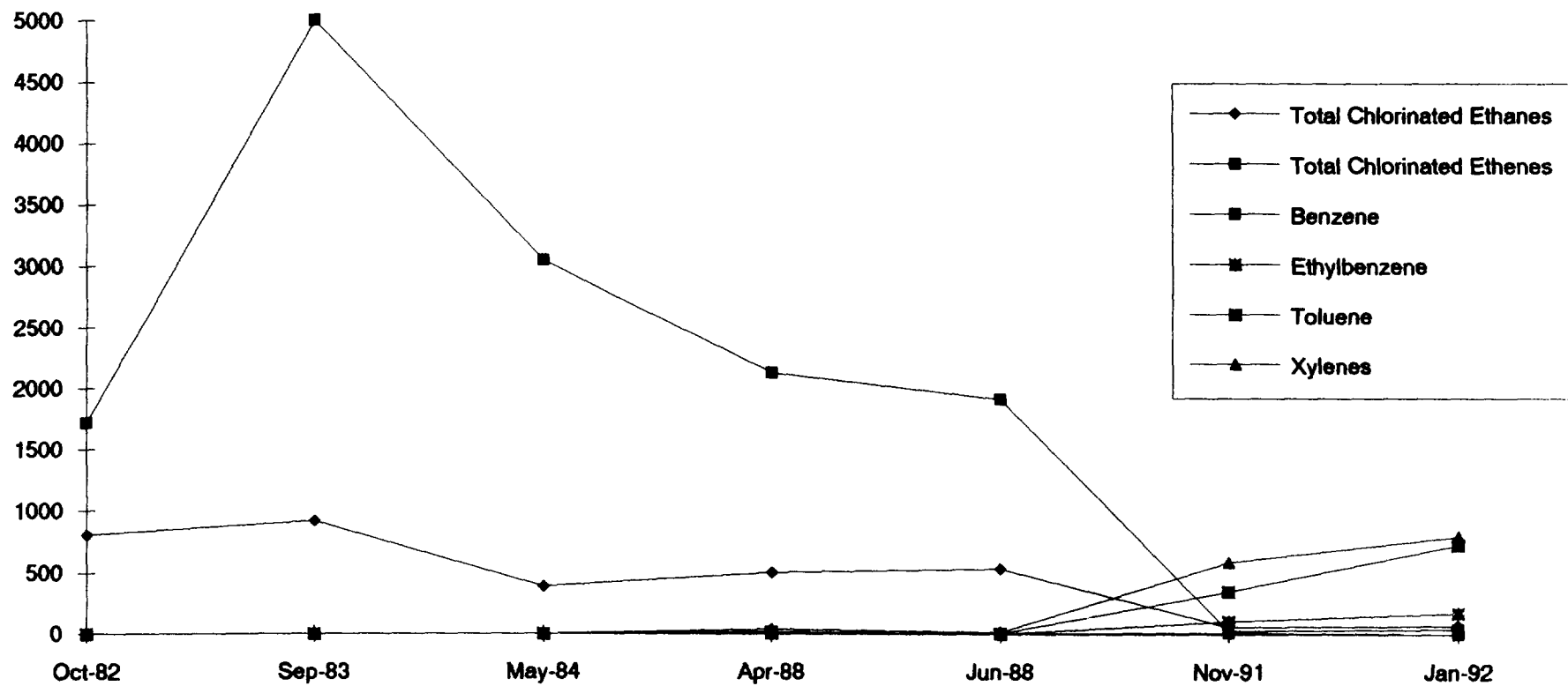
GRAPHS OF GROUNDWATER
QUALITY AT SELECTED WELLS

Piezometer P6



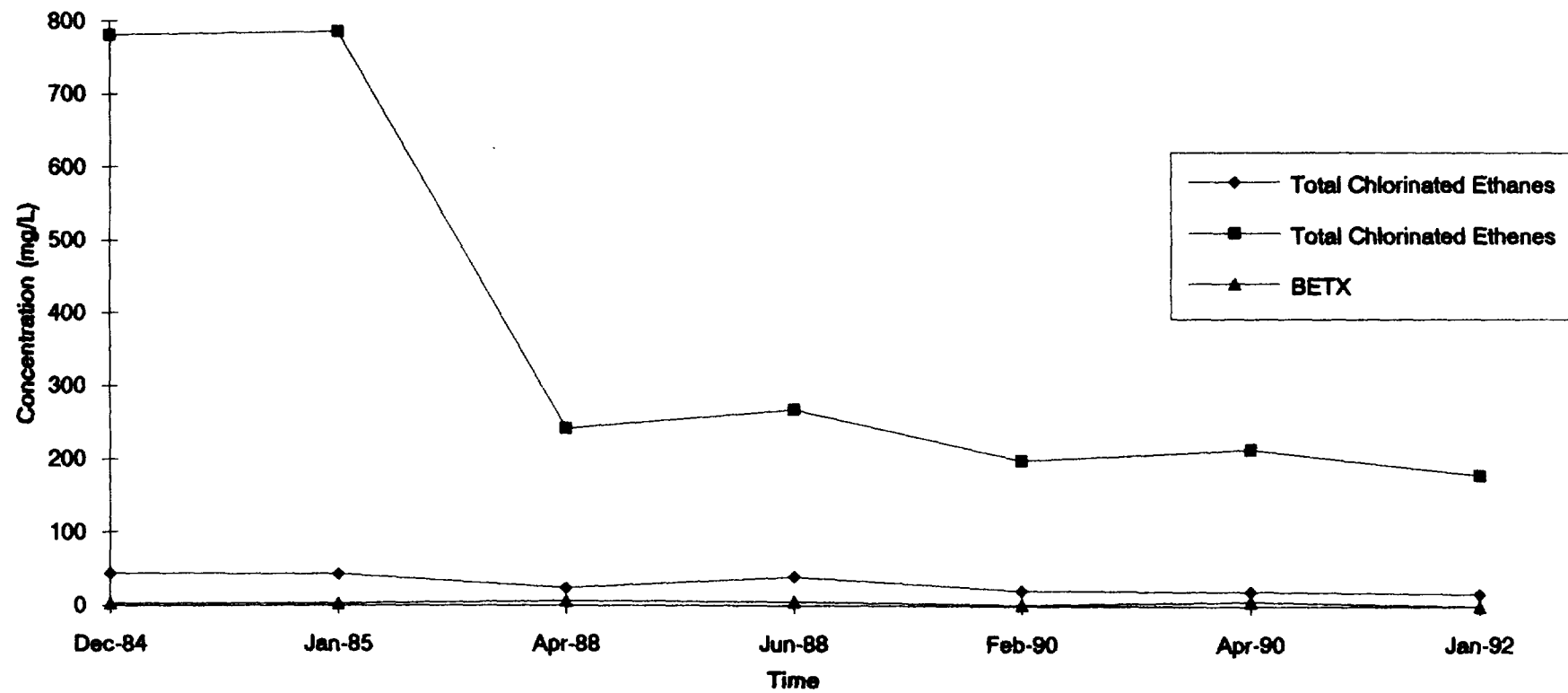
Analytical results are from samples collected by Warzyn.

Monitoring Well B4



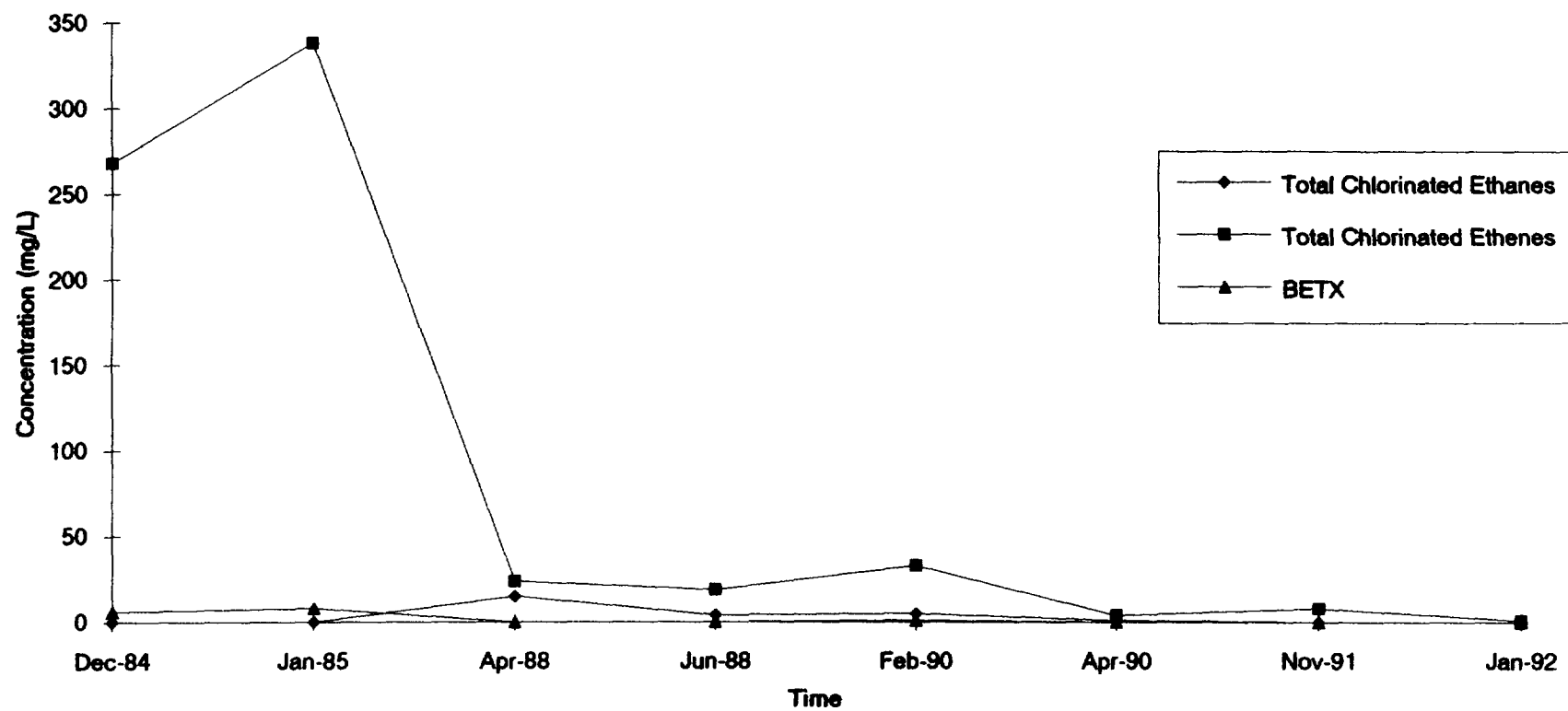
Analytical results dated 10/82 and 9/83 are from samples collected by Ecology and Environment; dated 5/84 collected by E. C. Jordan; others collected by Warzyn.

Monitoring Well B13



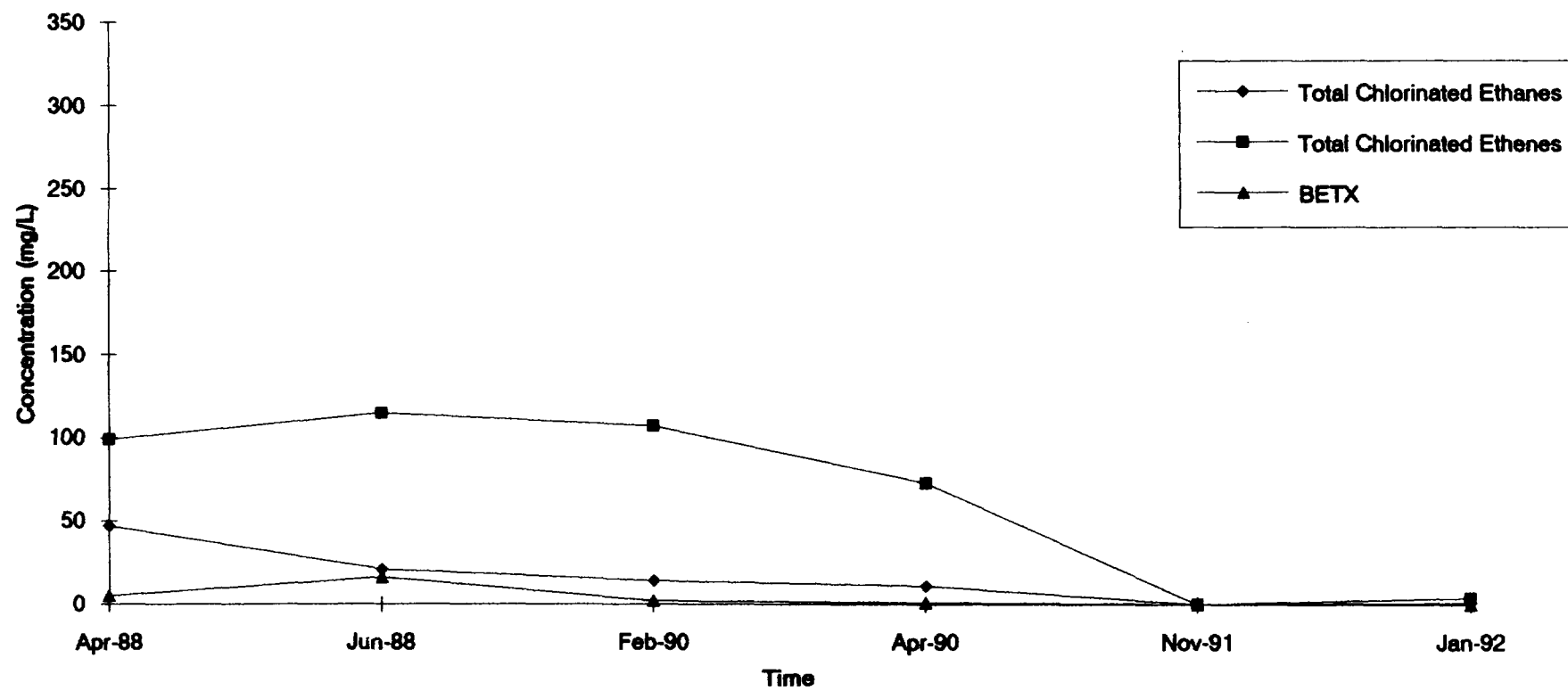
Analytical results are from samples collected by Warzyn.

Monitoring Well G109



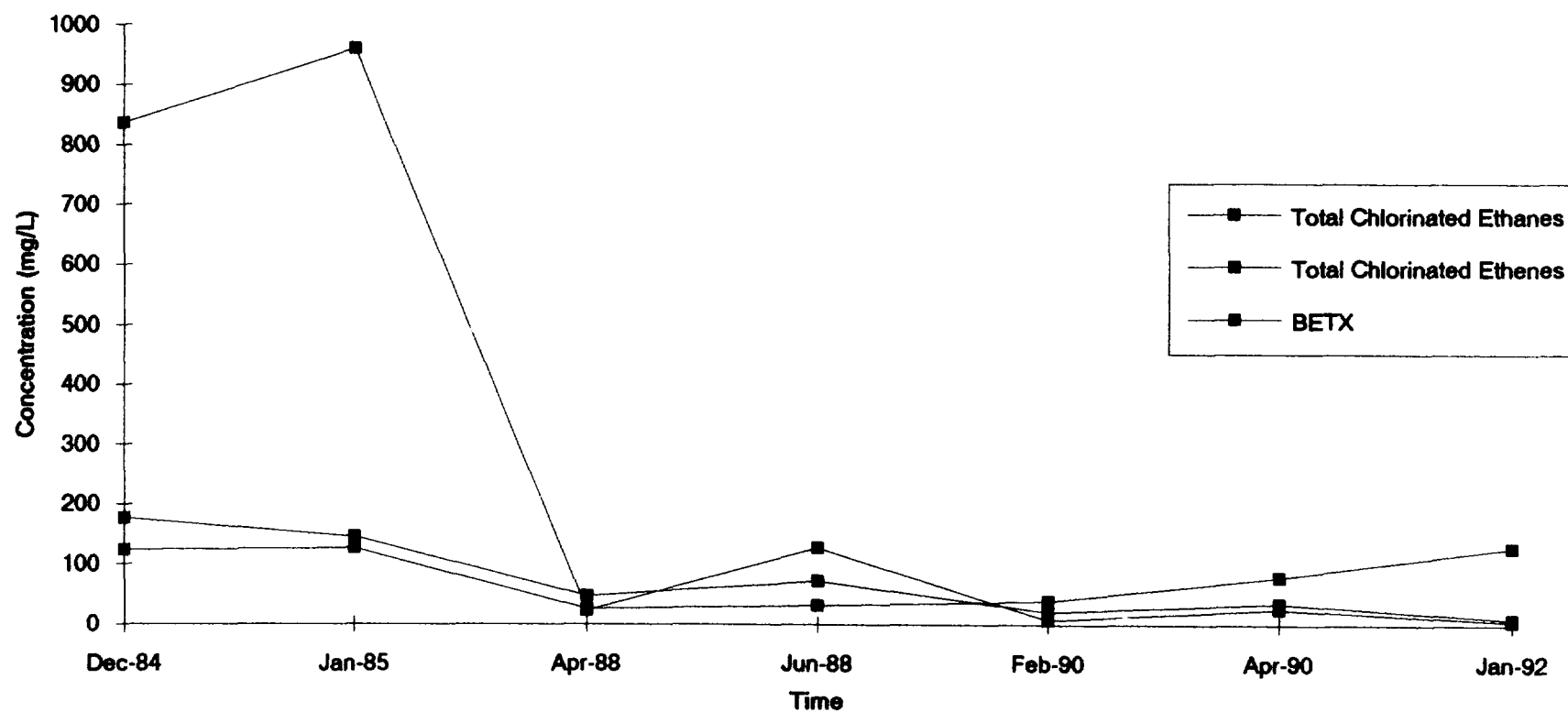
Analytical results are from samples collected by Warzyn.

Monitoring Well G109A



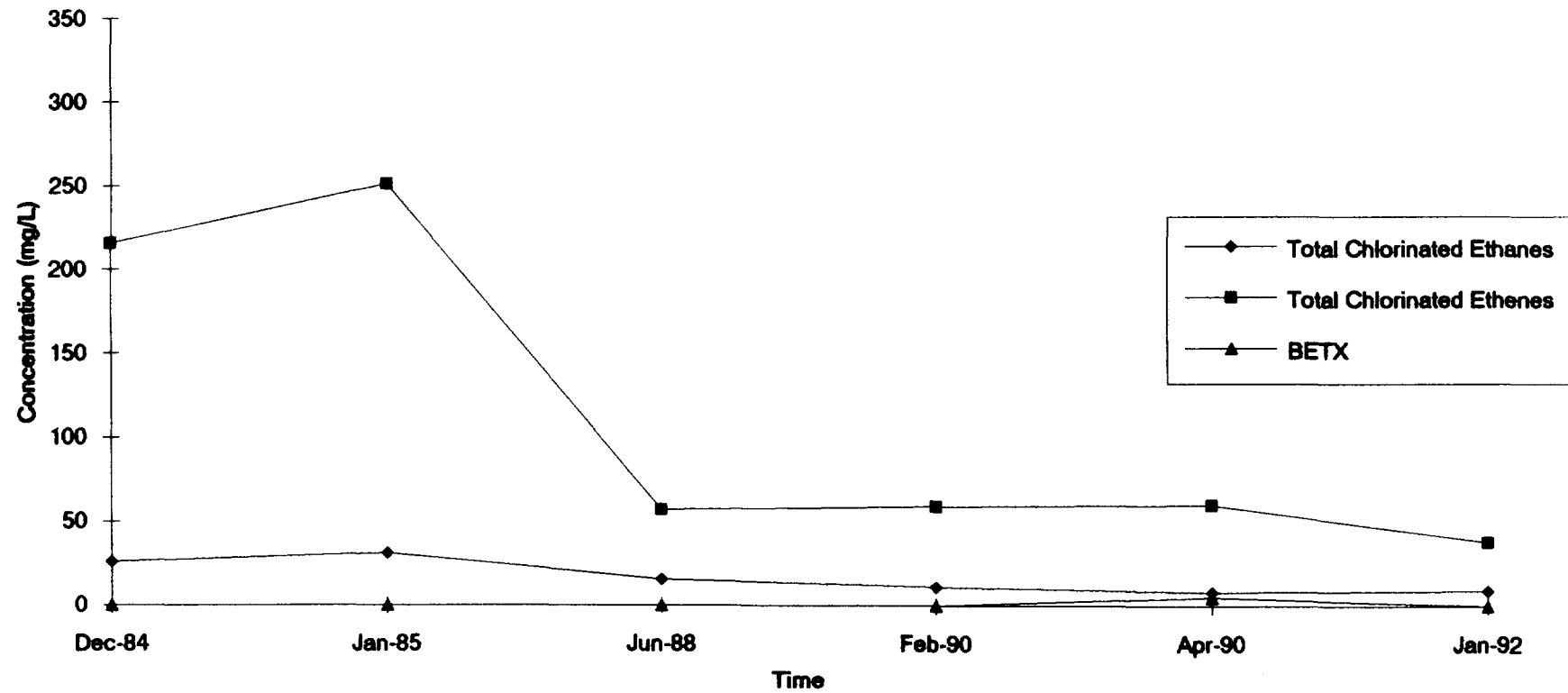
Analytical results are from samples collected by Warzyn.

Monitoring Well G110



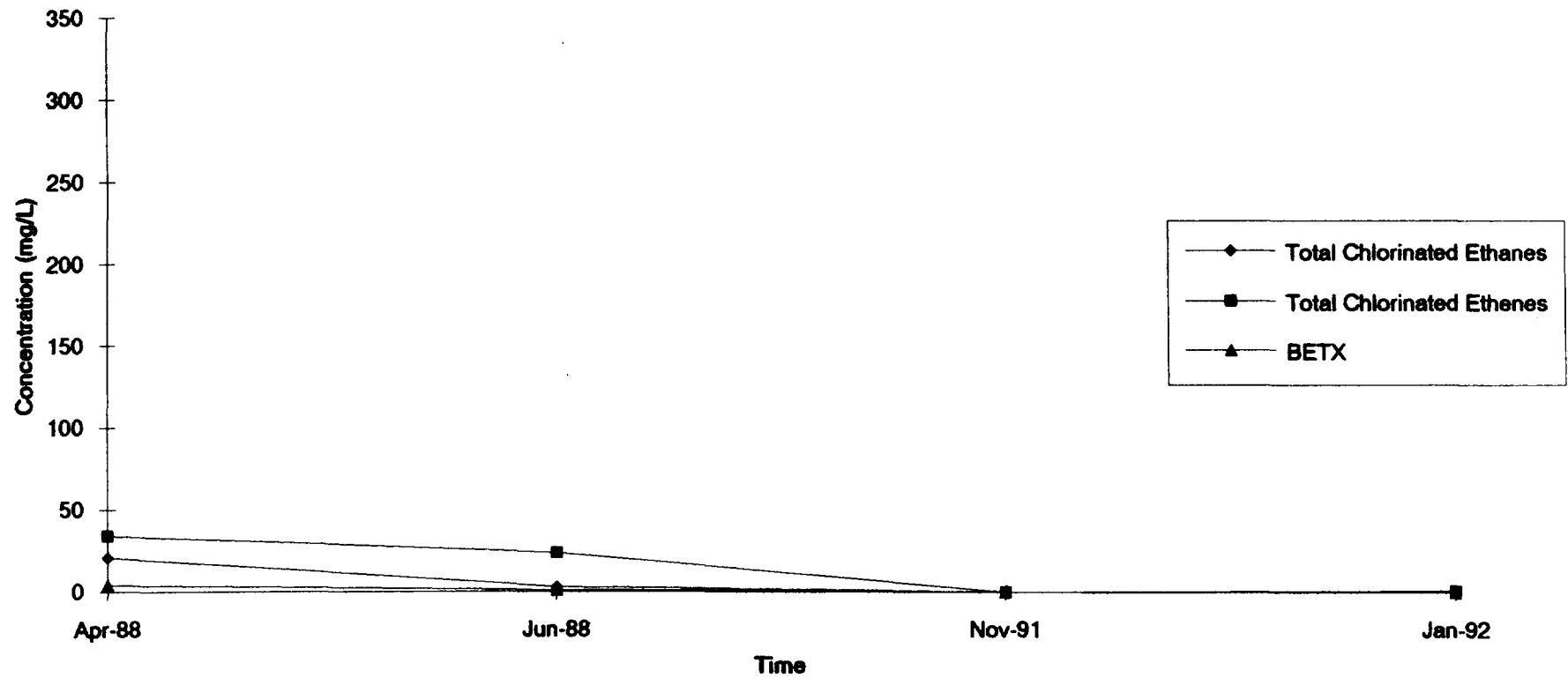
Analytical results are from samples collected by Warzyn.

Monitoring Well G111



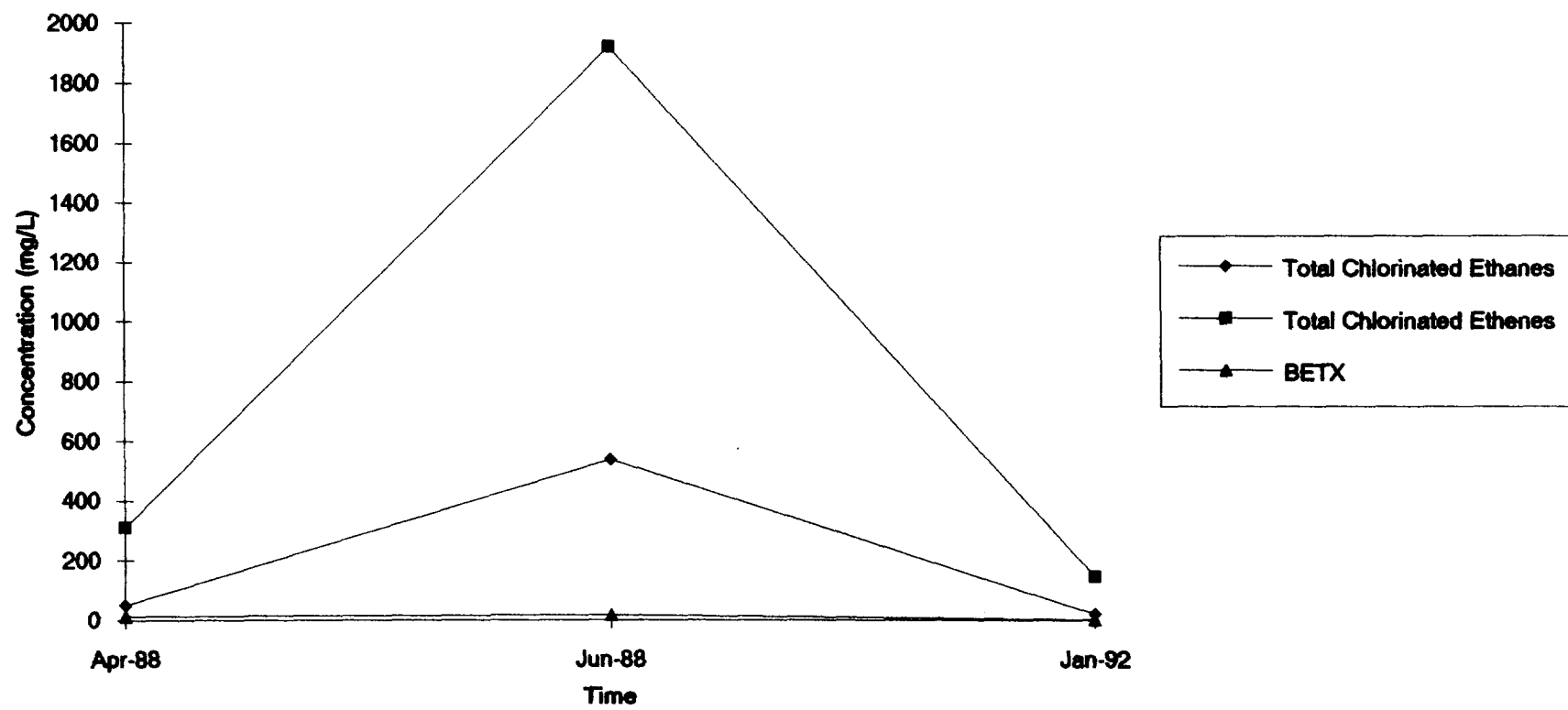
Analytical results are from samples collected by Warzyn.

Monitoring Well G113



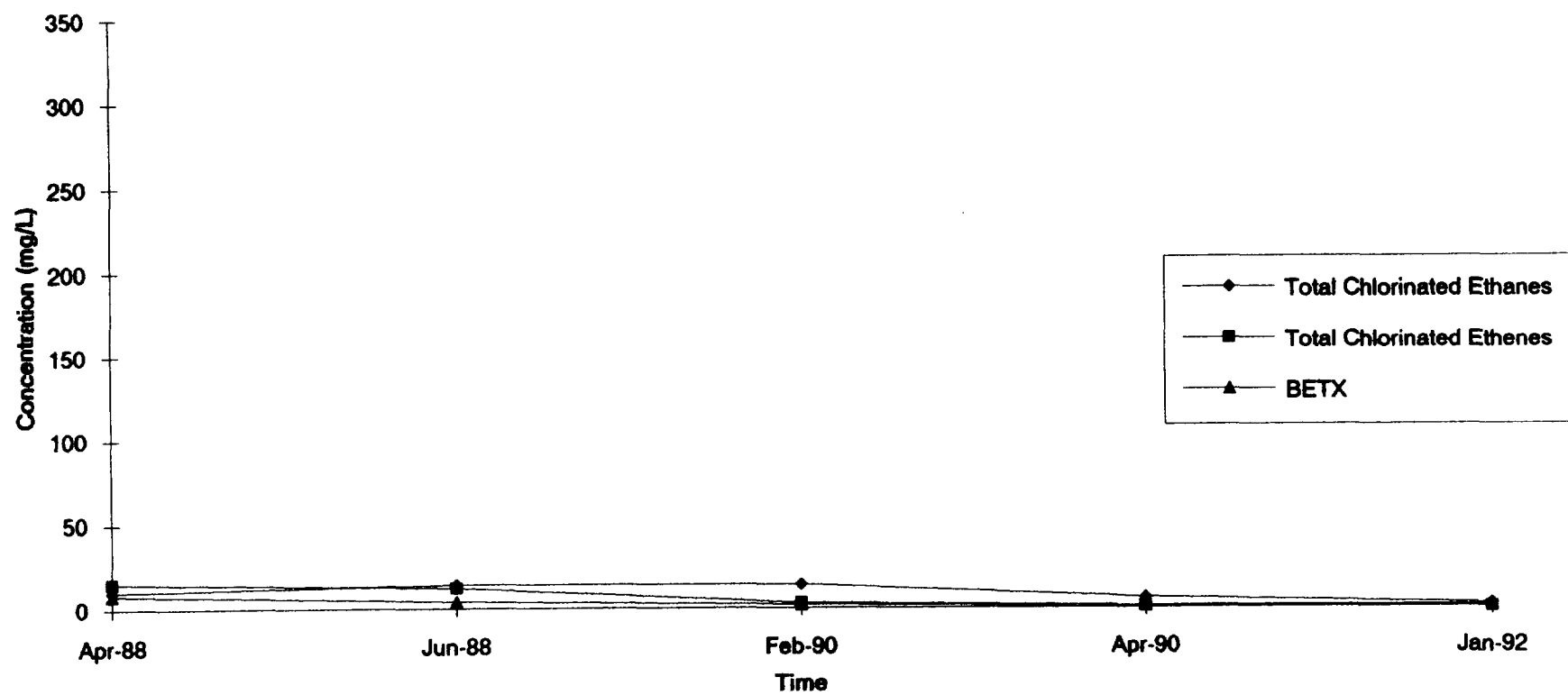
Analytical results are from samples collected by Warzyn.

Monitoring Well G113A



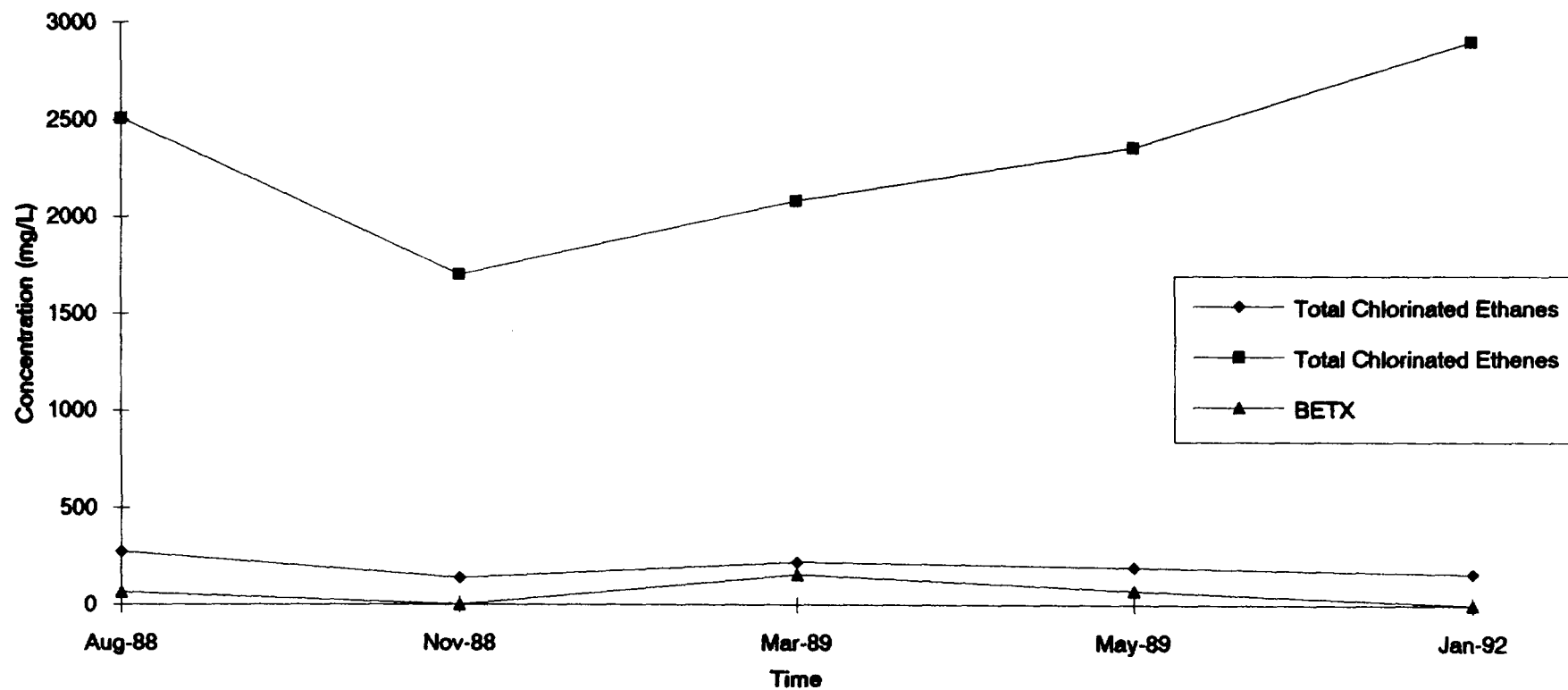
Analytical results are from samples collected by Warzyn.

Monitoring Well G114



Analytical results are from samples collected by Warzyn.

Monitoring Well MW202



Analytical results dated 8/88, 11/88, 3/89, and 5/89 are from samples collected by Harding Lawson Associates; dated 1/92, collected by Warzyn.